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# ENVIRONMENTAL INVESTIGATIONS

# NIAGARA RIVER SHOREWELLS

MARCH 1994

Ontario

Ministry of
Environment
and Energy

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# ENVIRONMENTAL INVESTIGATION

# NIAGARA RIVER SHOREWELLS

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# 1.0 INTRODUCTION

## 1.1 BACKGROUND

As part of the Remedial Action Plan (RAP) investigations on the Niagara River, the Ontario Ministry of the Environment and Energy (MOEE) issued a contract to investigate the extent of the use of shorewells along the Niagara River and Chippawa Creek.

This investigation was initiated in response to a data gap identified by the Public Advisory Committee (PAC) during the preparation of Stage I of the Niagara River Remedial Action Plan. While writing the Stage I report on environmental conditions and problem definition, it was identified by the PAC that some users of the Niagara River were missed.

Essentially, an unknown number of people along the Niagara River were thought to take their water directly from the Niagara River via the use of shallow wells along the river bank or in the waters of the river (shorewells). The extent of treatment, and the uses to which the water were being put, were not known. The water quality was expected to meet Ontario Drinking Water Objectives; however, data were not available to support this expectation.

On November 20, 1992 Arcturus Environmental Limited (Arcturus) was contracted by the Ministry of the Environment and Energy (MOEE), to locate and conduct a survey of shorewell use. The field work was conducted during January and February of 1993.

### 1.1.1 STATEMENT OF WORK

As the project progressed and more information became available, a number of changes to the statement of work were made. The final revised statement of work is listed below:

- the number of shorewells and shorewell users would be determined
- a questionnaire survey would be conducted on all shorewell users on the Niagara River Parkway
- seventy five bacteriological samples would be taken from "as consumed" sources
- twenty general chemistry samples would be obtained from treated water
- twenty general chemistry samples would be obtained from taps having untreated water taps located on the pressure side of the pumping system.

## 1.2 OBJECTIVES

The objectives of this study were to:

- determine the location of each active shorewell along the Niagara River and Chippawa Creek
- obtain information from the people who use the shorewells
- determine the uses of the water obtained from the shorewells
- provide an indication as to the extent of any water quality concerns associated with the shorewells
- obtain water samples from shorewell sources and submit samples for laboratory analysis in order to obtain quantitative results of the water quality obtained from the shorewells.

## 1.3 SITE LOCATION

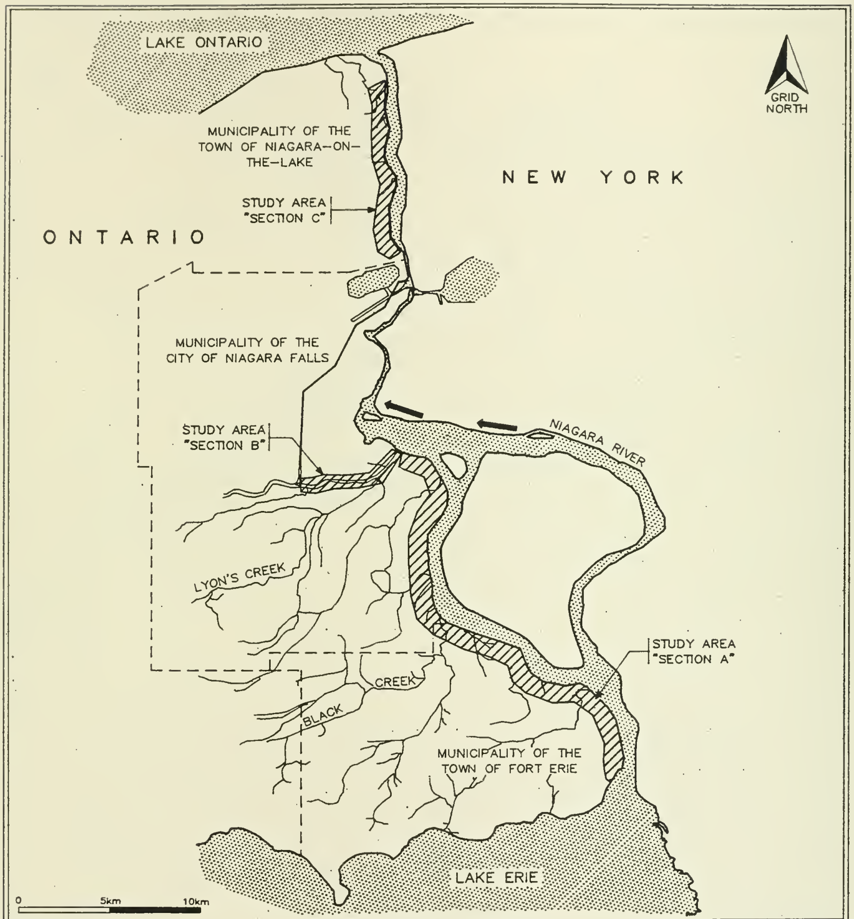
The Niagara River is fed from Lake Erie and flows generally north towards Lake Ontario. The study area is divided into three sections, which are:

**Section A:** the length of the Niagara River between the Peace Bridge in Fort Erie and Main Street in Chippawa

**Section B:** both sides of Chippawa Creek from the lighthouse in King's Bridge Park, Chippawa to the Queenston-Chippawa Hydro Electric Power Canal (HEPC)

**Section C:** the portion of the Niagara River between the new Queenston water pollution control plant and Navy Hall at Fort George in Niagara-On-The-Lake.

Figure 1 is a map of the Niagara River watershed showing the boundaries of the study area. Figures 2, 3, and 4 show greater details of Sections A, B, and C, respectively.



LEGEND

– – – APPROXIMATE LOCATION OF MUNICIPAL BOUNDARY

SHOREWELL
INVESTIGATION
STUDY AREA
SECTIONS
NIAGARA RIVER
SHOREWELLS

| | |
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SCALE 1: 250000

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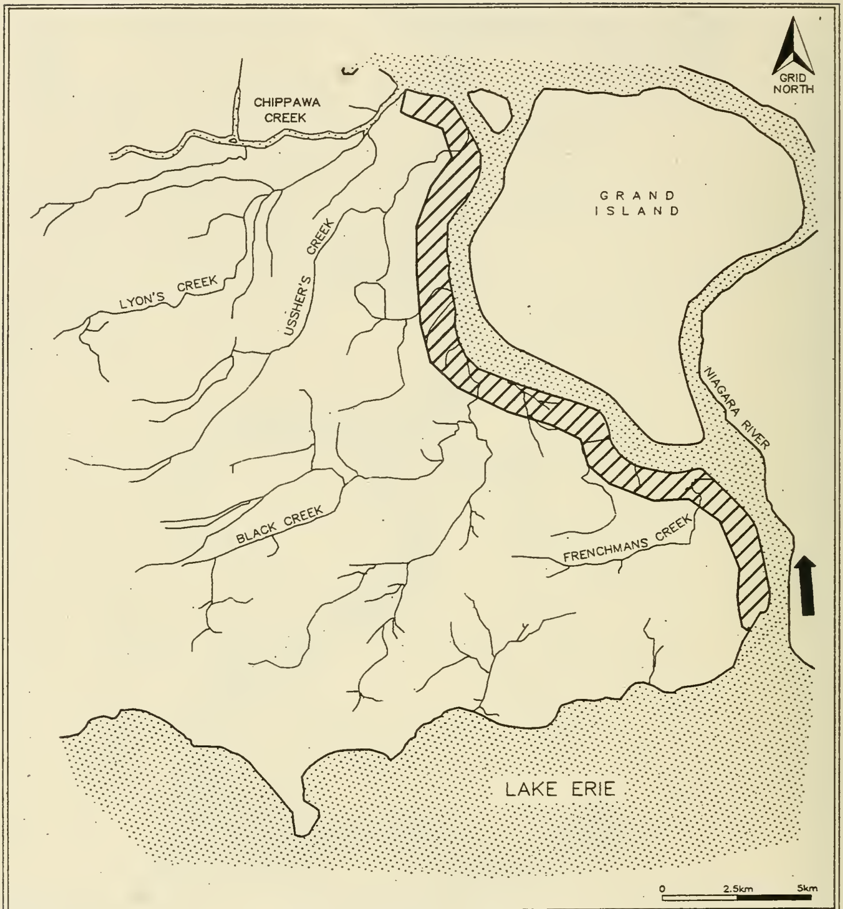
DRAWING No.

FIGURE 1



LEGEND

← FLOW DIRECTION

▨ STUDY AREA "SECTION A"

SHOREWELL INVESTIGATION STUDY AREA "SECTION A"
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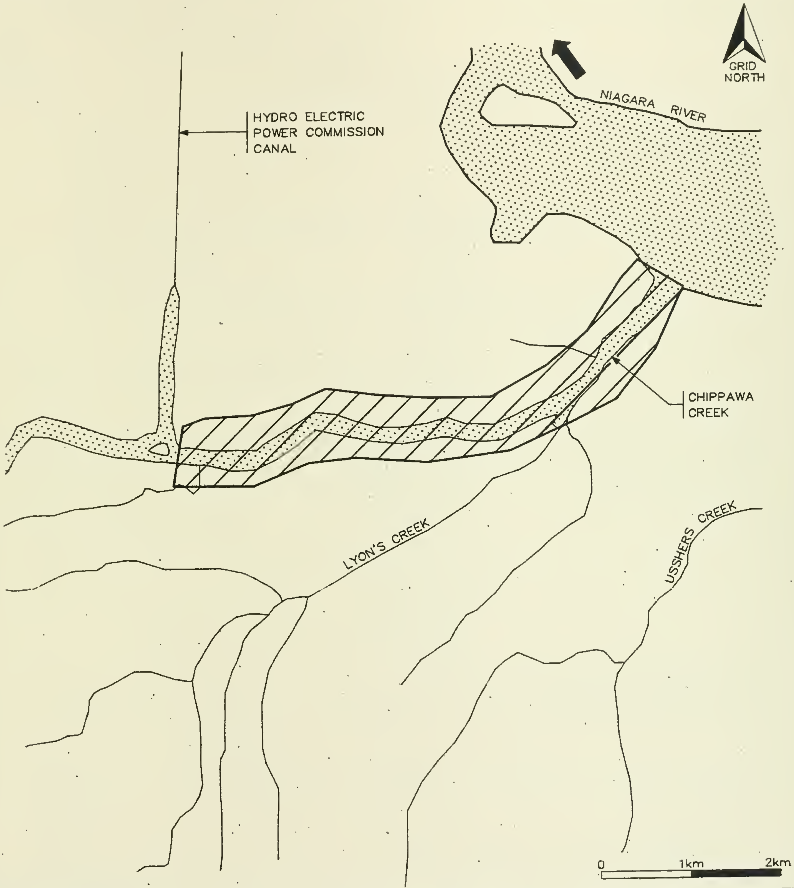
FIGURE 2



LEGEND

← FLOW DIRECTION

▨ STUDY AREA "SECTION B"

SHOREWELL INVESTIGATION STUDY AREA "SECTION B"
NIAGARA RIVER SHOREWELLS

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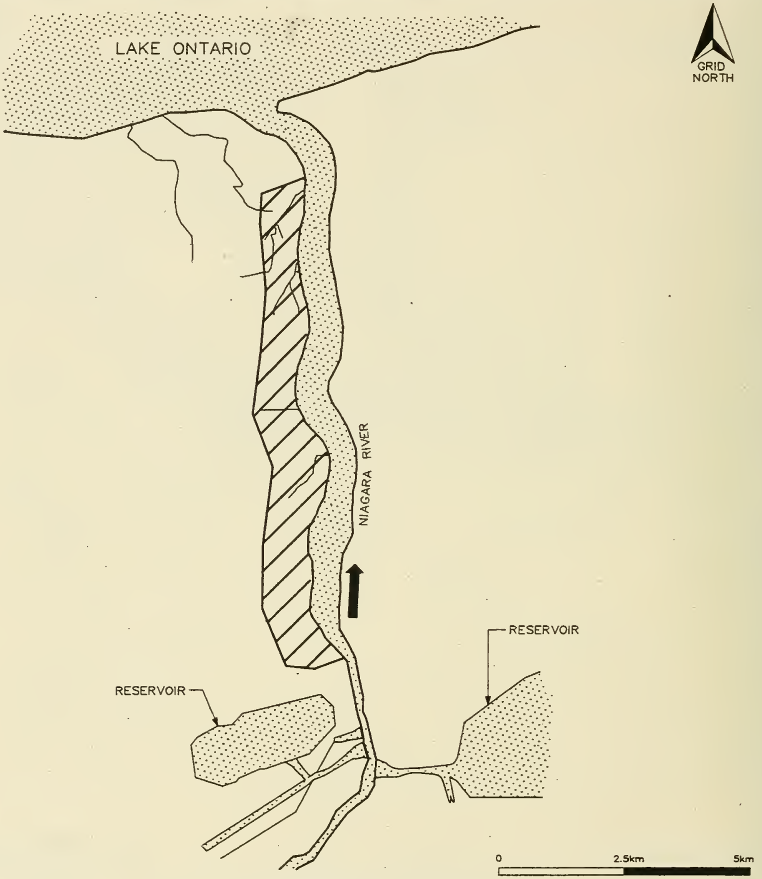
FIGURE 3



LEGEND

← FLOW DIRECTION

▨ STUDY AREA "SECTION C"

SHOREWELL INVESTIGATION STUDY AREA "SECTION C"

NIAGARA RIVER SHOREWELLS

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FIGURE 4

## 2.0 LITERATURE SEARCH

Information regarding the Niagara River shorewells was obtained from the following sources:

- the Niagara Parks Commission
- the Ministry of the Environment and Energy
- air photos
- 1:10,000 scale topographic maps
- municipal water supply maps for Niagara-On-The-Lake, Niagara Falls, and Fort Erie
- Ministry of Northern Mines and Development, Ontario Geological Survey Quaternary Geology and Bedrock Geology maps
- knowledgeable residents
- Culligan Niagara Water Conditioning Limited of Niagara Falls (Culligan), the company that supplies and maintains many of the treatment systems for the shorewells located along the Niagara River.

The Niagara Parks Commission made available to Arcturus a list of all of the residents along the Niagara River Parkway, and highlighted areas where there were shorewell users. The list provided an excellent base to start implementing the survey and was extremely useful to this investigation.

Arcturus was able to interview Mr. L. Wales of the former Wales Plumbing Limited of Stevensville, Ontario. Mr. Wales is the son of the original designer of the shorewells who first started installing the shorewells in the late 1930's. Mr. Wales assisted his father with many of the shorewell installations along the Niagara River. Arcturus also interviewed personnel from J. W. Furness Plumbing, Heating & Air Conditioning Limited of Stevensville. This plumbing company bought out Wales Plumbing and has continued the installation of shorewells along the Niagara River.

Any mention of products or services does not imply endorsement by MOEE.

The results of these investigations are found in Section 5.0 of this report.

## 2.1 PHYSICAL SITE CHARACTERISTICS

Section A is approximately 24 km in length from the Fort Erie Peace Bridge to Main Street in Chippawa. Section B is approximately 6.5 km in length from King's Bridge Park in Chippawa, to the mouth of the Queenston-Chippawa HEPC. Section C is approximately 10 km in length from the new Queenston Water Pollution Control Plant to Navy Hall at Fort George, Niagara-On-The-Lake.

The southeastern section of the Niagara Peninsula is part of the Niagara River drainage basin. Several small creeks discharge into the Niagara River and make minor contributions to the total volume of water flowing in the Niagara River.

Chippawa Creek flows from the Niagara River westward and supplies water to the Queenston-Chippawa HEPC. The natural flow direction of the Welland River was reversed when Niagara River water was diverted to supply the HEPC, when it was built. The canal required a greater volume of water than the Welland River alone could supply.

## 2.2 FACILITY CHARACTERISTICS

Residents along the Niagara River and Chippawa Creek obtain their water supply from:

- shorewells
- waterlines
- municipal water sources
- cisterns.

Shorewells are typically constructed of two concrete tiles stacked on a crushed stone bed and placed at the shore of the Niagara River. A waterline with an attached foot valve passes through a hole in the side of the concrete tiles to withdraw water. A pump (or pumps), usually located in the garage or basement of the residence, draws water from the shorewell and pumps it through a treatment system. The treated water is then pumped through the distribution system of the residence. A more detailed description of the shorewell construction is found in Section 4.1.

A waterline, typically a metal, an acrylonitrile butadiene styrene (ABS), or a polyvinyl chloride (PVC) pipe extends into the river, terminating with a foot-valve. A pump draws the water directly from the river to the residence.

Municipal water sources supply selected areas along the Niagara River Parkway. The main serviced areas are Fort Erie, Niagara Falls, Niagara-On-The-Lake, Queenston, and a small section about Black Creek (Stevensville).

Cisterns, which are underground holding tanks that require periodic refilling by a commercial supplier, are also utilized. A pump draws the water from the cistern and through the distribution system in the residence.

## 2.3 CONTAMINANT CHARACTERISTICS

The potential contaminants of concern are:

- total coliform bacteria
- fecal coliform bacteria
- metals
- pesticides (both organo-chlorine and organo-phosphate)
- herbicides
- chlorophenols
- carbaryl
- base/neutral extractable organics.

See Appendix I for a complete list of all analytes.

The potential sources of these contaminants, which are dissolved or suspended in the surface/groundwater, may be:

- surface water from Lake Erie
- surface run-off water or groundwater leachate from agricultural land
- contaminated groundwater
- surface water flowing into the Niagara River from tributaries
- runoff or leachate from septic systems
- human activity
- animal and water fowl activities.

# 3.0 FIELD METHODOLOGY

## 3.1 QUESTIONNAIRE

### 3.1.1 GENERAL QUESTIONNAIRE

A preliminary phone list and address information of residences along the Niagara River was obtained from the Niagara Parks Commission (NPC). This list also included residences, located on small crescents adjacent to the Niagara River Parkway, which were supplied by Niagara River water.

Initially, the study involved obtaining information about the shorewells, including:

- the number of people who use them
- description of shorewells (i.e., location, design, age, etc.)
- the quality of untreated and treated water
- whether or not treatment systems are utilized, and what type of treatment systems are involved
- how the shorewell water is used (i.e., drinking, cooking or other domestic uses, such as laundry and bathing).

This information was obtained by contacting a knowledgeable occupant of each residence along the Niagara River and conducting an informal interview, based on an MOEE-approved questionnaire developed by Arcturus (see Appendix II).

Arcturus conducted the interview over the telephone for the majority of the residents. Where telephone contact was unsuccessful, each house was visited and the interviews were conducted in person where possible.
The questionnaire was divided into two sections Part A and Part B. Part B is discussed in section 3.1.2.

Part A of the questionnaire (Appendix II), is divided into eight sections, each relating to a different topic. The information contained in each section is as follows:

Section 1 confirmed:

- names of occupants and/or owners of the residence
- address of the residence
- number of permanent and/or seasonal occupants at the residence.

Section 2 determined the source of water supply for the residence. If the source was a shorewell, details were obtained on where the shorewell was located.

Section 3 determined:

- the intended use of the water supply (domestic, potable, irrigation or livestock watering)
- whether there was a secondary water supply utilized and for what purpose
- whether the shorewell was shared, and if so, by how many residences
- whether the residence had an MOEE permit to take water
- whether the residence had any other water-use permits (eg. NPC shorewell licence).

Section 4 determined:

- when the shorewell was constructed
- the name of the contractor who constructed the shorewell
- the method of construction (dug, bored and/or drilled)
- if there have been any occurrences of erosion, flooding and/or siltation at the shorewell
- the age of pump
- the history of maintenance of shorewell and pump.

Section 5 determined whether the water was treated, and the type of treatment systems utilized which may include:

- filtration
- activated carbon
- chlorination
- distillation
- reverse osmosis
- water softener
- ultra-violet light treatment
- other (chemical precipitation, settling).

Section 6 contained a review of the shorewell user's impression of the untreated and/or treated water quality, including:

- a general description of water quality
- the taste, odour, colour, temperature, turbidity, hardness and mineral content of the water
- whether or not the water, from the shorewell, stained porcelain fixtures.

Section 7 outlined the sampling program, established the suitability of obtaining a sample at that residence, and determined the presence of taps that supply untreated water.

Section 8 provided contacts at the MOEE and at Arcturus if the shorewell user required further information about the study.

### 3.1.2 SAMPLING QUESTIONNAIRE

A short interview was conducted with the resident when each water sample was obtained. The interview was based on Part B of the questionnaire which was used to verify the mailing address of the residence and to verify the treatment system information. This information determined which of the parameter groups would be submitted for analysis. A copy of Part B of this questionnaire is located in Appendix II.

## 3.2 WATER SAMPLING

Approximately 75 shorewell systems were sampled for bacteriological analyses. Approximately 15% of these shorewells were sampled and also submitted for MOEE-specified general chemistry, metal, and toxic organic parameters.

### 3.2.1 SAMPLE ANALYSES

The bacteriological samples were analyzed for total coliform and fecal coliform counts per 100 mL at the Ministry of Health Laboratory in Hamilton, Ontario. All other analyses were conducted by MOEE laboratories in Rexdale, Ontario.

#### 3.2.1.1 Sampling Procedures

Sample bottles for the bacterological analyses were provided by the Niagara Regional Health Services Department for this study. Samples were obtained by Arcturus technicians from "as consumed" water taps with the exception of a few grab samples from the rivers or from the shorewell directly.

The taps were flushed for a minimum of three minutes before a sample was taken.

Extreme care was taken to ensure that the potential for extraneous contamination was minimized. The sample was then sealed and labelled immediately. The sample was placed in a temperature controlled field storage container (i.e. cooler) which maintained a constant 4°C storage temperature.

#### 3.2.1.2 Quality Assurance/Quality Control

To ensure field quality assurance/quality control (QA/QC), one field duplicate was taken for every ten samples obtained. The purpose of the field duplicates was to verify the accuracy of laboratory procedures.

A trip blank, prepared from distilled water provided by Arcturus Laboratory Services Limited, was bottled in the laboratory, and subjected to the same field conditions as that encountered by the other samples. The purpose of this trip blank sample was to verify that contamination was not introduced during transportation or handling of the sample.

All of these samples were labelled using blind numbers to ensure source confidentiality and unbiased analyses.

#### 3.2.1.3 Sample Transportation

All bacteriological samples were transported via automobile to the Niagara Regional Health Services Department Office on Kitchener Street, in Niagara Falls, Ontario, before 10:00 am on the morning after the samples were obtained. A courier transported the samples to the Ministry of Health analytical laboratory in Hamilton, Ontario, to ensure submission of the bacteriological samples to the Hamilton laboratory within 24 hours of sampling.

### 3.2.2 GENERAL CHEMISTRY AND ORGANIC PARAMETERS

The general chemistry parameters and organic parameters were separated into eight parameter groups, (MOEE test group codes in brackets) namely:

- organochlorine pesticides (OWOC)
- carbaryl (PECAR)
- organo-phosphate pesticides (PEOP)
- chlorophenols (OWCP)
- triazine herbicides (OWTRI)
- MISA base/neutral extractable organics (MISA-19)
- metals (HMPPI)

- total Kjeldahl nitrogen, ammonia nitrogen, nitrate nitrogen, nitrite nitrogen, iron, manganese, hardness, calcium, magnesium, sodium, potassium, alkalinity, chloride, sulphate, pH, conductivity, and ionic balance calculation (WCGWIB).

A complete list of these parameters can be found in Appendix I.

#### 3.2.2.1 Sampling Procedures

All of the general chemistry and organic parameter samples were obtained from both untreated water and treated water taps from the same selected residences. Sample bottles, provided by the Ministry of the Environment and Energy, were utilized for this study. Untreated water samples were obtained by Arcturus technicians from taps prior to treatment within the confines of the residence. Several untreated water samples were obtained directly after the pump, while some were collected from taps located after the pressure tank but prior to any treatment. The remaining samples were obtained from outdoor taps that were connected to distribution lines that did not pass through the treatment systems. Untreated water samples were obtained from the most readily accessible source.

The treated water was obtained by Arcturus technicians from the same tap as the bacteriological sample, usually the kitchen or bathroom faucets. The taps were flushed for a minimum of three minutes before a sample was taken.

The sample was sealed, labelled and placed in a shipping box. Care was taken to ensure the required sample temperature (as defined by protocol) was maintained during shipment.

#### 3.2.2.2 Quality Assurance/Quality Control

The field quality assurance/quality control procedures undertaken for the general chemistry parameters are described in Section 3.2.1.2.

#### 3.2.2.3 Sample Transportation

All samples were shipped by courier the day after the sampling was conducted. The samples reached the Ministry of the Environment and Energy Laboratory Services Branch in Rexdale, Ontario within 48 hours of sampling.

# 4.0 FINDINGS

## 4.1 DESIGN AND CONSTRUCTION OF SHOREWELLS

Shorewells along the Niagara River were first installed in the early 1930's by Wales Plumbing Limited of Stevensville, Ontario. The following description consolidates the information obtained through interviews with the designer's son, installation personnel, residents, and observations made by Arcturus technicians.

The design of the shorewells varies marginally from Section to Section and also shorewell to shorewell. Typically, a shorewell was constructed out of two 1.2 m (4 feet) diameter concrete tiles, placed vertically on a bed of crushed stone. During the construction of a shorewell, a 2 to 2.5 m hole was excavated into the river bank with a backhoe or excavator. Most shorewell designs included a trench dug out into the river as far as the backhoe or excavator could reach. Approximately 20 tonnes of 19 mm or 13 mm (3/4 inch or 1/2 inch) crushed stone (one tandem truck load) was placed into the bottom of the hole and the trench. The concrete tiles, which were usually circular or oval shaped, were then stacked in the hole and fitted with a recessed concrete or steel lid, designed so that it would not be affected by ice in the river. A 38 mm to 50 mm (1½ inch to 2 inch) water intake pipe with a foot valve was installed a minimum of 1 m (3 feet) below the surface of the water. A schematic diagram depicting the design and location of a typical shorewell is shown in Figure 5.

The waterline was buried within a trench, from the shorewell to the house, at a depth of approximately 1 m. The waterline entered the building and was connected to a pump, which was usually located in the basement or the garage. The water was pumped through the treatment system, where it was then distributed throughout the plumbing system in the residence.

Several houses have separate distribution systems for the untreated water. The separated systems allowed untreated water to be delivered to special taps, usually intended for irrigation of lawns.

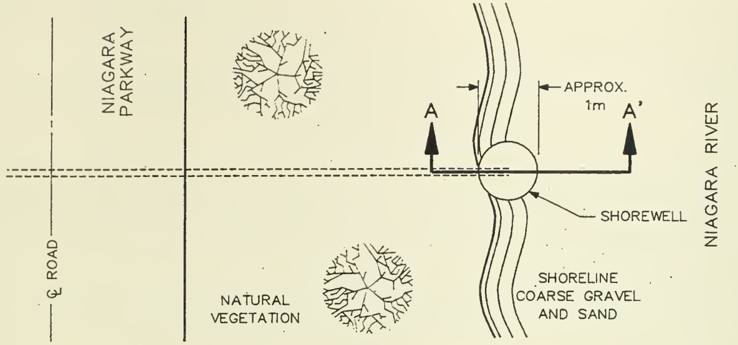
One shorewell (1-28) was constructed so that a waterline from the river pumped water into a structure, which was similar in design to the other shorewells but was located on the front lawn. The water flowed through a gravel bed at the bottom of the well and was then pumped into the house through the treatment and distribution system.

### 4.1.1 DESIGN OF WATERLINE

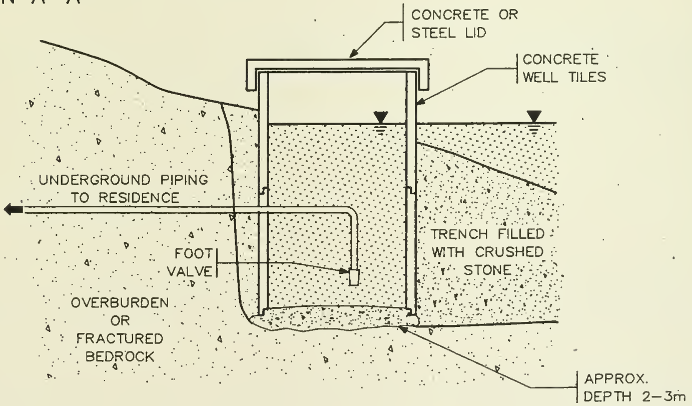
Waterlines were utilized by residents along the Niagara River Parkway until the shorewells were first constructed in the early 1930's. Some waterlines are still used. The waterline is usually a 38 mm to 50 mm (1½" to 2") ABS, PVC plastic or metal pipe that extends out into the river. Most of the waterlines extend past the shelf in the Niagara River, following the contour of the river bed and then turns upwards towards the surface of the river where a foot-valve is attached to the end of the waterline. This configuration elevates the water intake from the bottom of the river.

Several large diameter waterlines, approximately 150 mm to 200 mm (6 inch to 8 inch), were located in the lower Niagara River (Section C). Each waterline consisted of a section which had a screen at the end. When in use, the screened section would extend out into the river. These waterlines, which were used solely for irrigation purposes, were winterized and partially disassembled at the time of investigation.

## SHOREWELL PLAN VIEW



## SHOREWELL CROSS–SECTION
## SECTION A–A'



CONCRETE OR STEEL LID
CONCRETE WELL TILES
UNDERGROUND PIPING TO RESIDENCE
FOOT VALVE
TRENCH FILLED WITH CRUSHED STONE
OVERBURDEN OR FRACTURED BEDROCK
APPROX. DEPTH 2–3m

LEGEND

▼ WATER LEVEL

● BRUSH/SHRUB

TYPICAL SHOREWELL LOCATION AND CONSTRUCTION
NIAGARA RIVER SHOREWELLS

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PROJECT No. E343.0
SCALE NOT TO SCALE
DRAWING No. FIGURE 5

## 4.2 TREATMENT SYSTEMS

The untreated water quality, which varies considerably along the Niagara River and Chippawa Creek, dictates the amount of water treatment required. Most of the treatment systems along the upper Niagara River (Section A) were installed by either Culligan or Kinetico Canada Limited of Fort Erie, Ontario.

Most residents were pleased with the treated water quality from their treatment systems.

A typical treatment system, based on observations and data obtained from Culligan, consists of a chlorinator, a pressure tank and a water conditioning unit. The conditioning unit may consist of a water softener and/or a sand filter, which is usually backwashed automatically. The order of these systems may vary, with the chlorinator located after the pressure tank. A schematic of a treatment system is shown on Figure 6. A typical treatment system was often augmented by retention tanks, a separate water softener, or activated carbon filters.

Auxiliary systems, such as a distillery and reverse osmosis system, may be hooked up to a separate tap at the kitchen sink which is used only for drinking water purposes. Activated carbon filters may be used as part of the distillery or reverse osmosis systems, or may be used as a separate filtration system. Some treatment systems substituted an ultra-violet light disinfection system for chlorination.

A few treatment systems consist of sand filtration only, or activated carbon filtration only. A summary of the treatment systems is found in Appendix III.

### 4.2.2 MAINTENANCE OF SHOREWELL, PUMPS AND TREATMENT SYSTEMS

Most shorewells require very little maintenance. The most common problem is siltation, which requires that the shorewell be pumped out occasionally. The frequency of pumping out varies from shorewell to shorewell. Most shorewells may require sediment removal once in 20 years, while some shorewells may need to be pumped out every 5 years.

Other less frequent shorewell maintenance problems include but are not limited to:

- replacing the entire shorewell
- replacing the gravel in the trench with new gravel
- replacing waterlines
- sealing the top of the shorewell with concrete.

The maintenance frequency of the pump varies, from some pumps not being maintained at all to the resident's knowledge, to some pumps having been completely rebuilt or replaced. Most pumps require very little maintenance, with minor periodic checks to keep everything operating smoothly. A list of the age of pumps is found in Appendix IV.

The maintenance frequency of the treatment systems also varies, depending on the untreated water quality. The most common maintenance performed on the treatment systems is replacing old filters. The water conditioning units are usually self-maintaining. Water conditioning salts (and less frequently activated carbon or filter sand) are replaced by the resident or by the water conditioning servicing company when required. Residence 1-303 utilizes an activated carbon filtration system, located under their kitchen sink, which requires weekly cleaning of the filter.

## 4.3 NUMBER OF SHOREWELLS

### 4.3.1 UPPER NIAGARA RIVER (SECTION A)

The Town of Fort Erie watermain extends as far north as the end of Service Road #3 (see Figure 7). The Niagara Falls municipal water supply extends as far south as Sarah Street in Chippawa. All areas between these two points, with the exception of the area immediately adjacent to Black Creek, are not on a municipal water supply (see Figure 7).

There are a total of 216 residences, located along Section A of the Niagara River Parkway, that are not on a municipal water supply. Information was obtained from 181 of these residences.

Arcturus was unable to contact the residents of a total of 22 residences within Section A. Most of these residents were away on vacation, while some were not home at the various times of the investigation. There were several occasions where residents were present, but did not answer the door.

Residents of the remaining 13 residences did not wish to participate in the survey. Some of the reasons given by the residents were:

- they did not want anything to do with the government
- they thought the survey was a big waste of taxpayer's money
- the survey was an invasion of privacy
- the survey questions were "stupid"
- they did not know if they should disclose the information.

#### 4.3.1.1 Source of Water

Most of the residences located along Section A of the Niagara River Parkway are serviced by shorewells. A total of 134 shorewells were identified through the questionnaire. An additional 13 shorewells were identified during a walking reconnaissance survey, further information could not be obtained on these shorewells. Thirty four shorewells were identified but not in use. Therefore, a total of 181 shorewells have been identified.

A total of 12 residences obtain their water supply from 38 mm to 50 mm (1½ inch to 2 inch) waterlines in the river, as determined through the questionnaires.

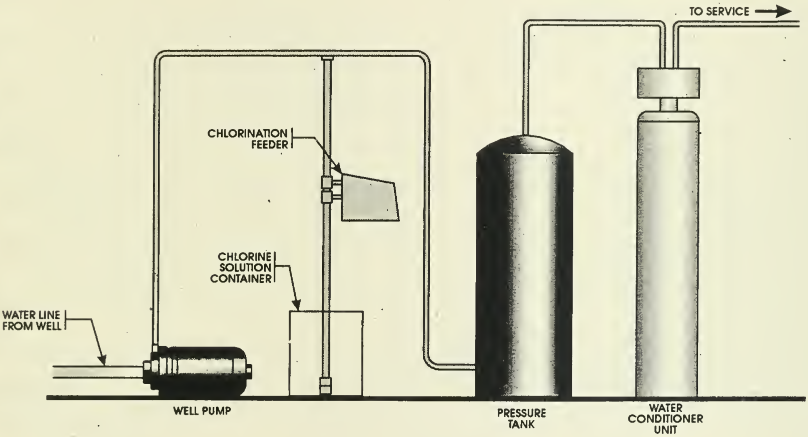
A total of 11 residences have cisterns as their water supply where a contractor from Stevensville (Bertie's Water Supply or Stevensville Water Service Ltd.) trucks in water, from a municipal water supply, and fills the cistern on a regular basis. Of the 11 residences using cisterns, 4 residences have a shorewell used primarily for irrigation or as a back-up source of water.

One residence utilizes a deep drilled well as the water source.

A list of all residence identifiers and their water supply source is found in Appendix IV.

There are 37 residences that share ten shorewells. A list of these shared wells is found in Appendix V.

In total, 173 verified households obtain water from the Niagara River through shorewells and water lines.



LEGEND

SCHEMATIC OF
A TYPICAL WATER
TREATMENT SYSTEM

NIAGARA RIVER
SHOREWELLS

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Ontario

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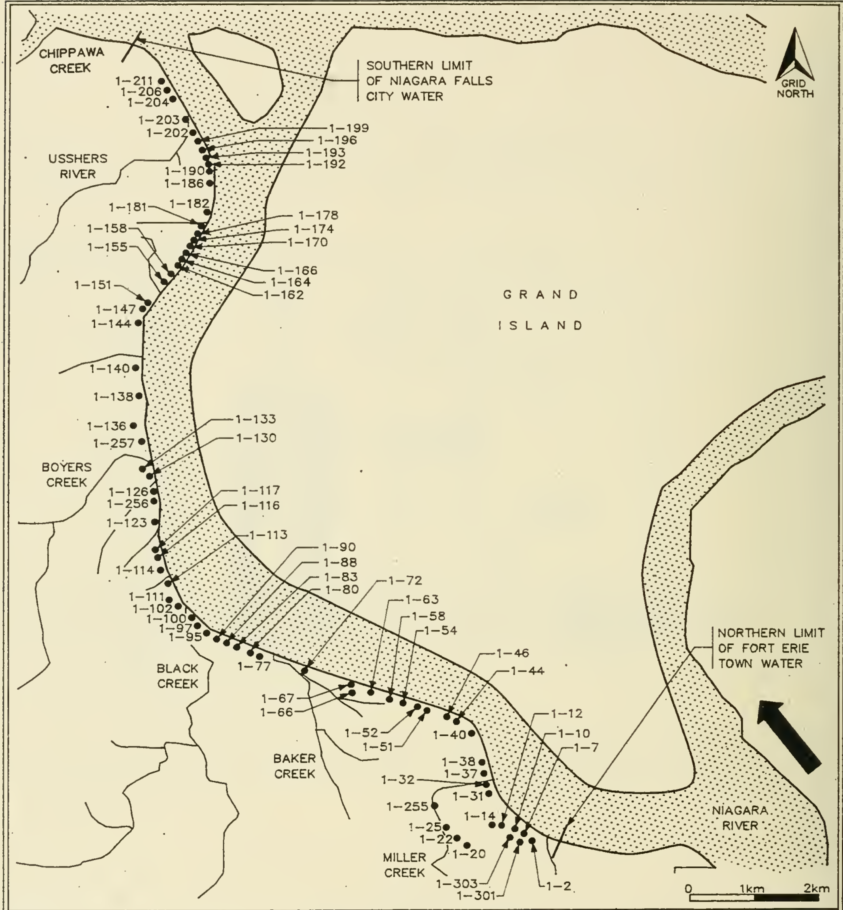
DATE MARCH 1993
PROJECT No. E343.0
DRAWING No. FIGURE 6
DRWN TVL
CHK'D AMA
SCALE NOT TO SCALE



LEGEND

- FLOW DIRECTION
- ● BACTERIOLOGICAL SAMPLE
- 1-2 SAMPLE IDENTIFICATION

BACTERIOLOGICAL
SAMPLES
"SECTION A"
NIAGARA RIVER
SHOREWELLS

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DATE FEBRUARY 1993
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### 4.3.1.2 Treatment Systems

Information about treatment systems was obtained from 176 residences out of the 181 residences contacted. The remaining five household occupants terminated the survey before information about the treatment system could be obtained. A total of 131 residences, of the 176 residences, possess treatment systems for their water supply. A total of 39 residences, which includes 7 residences utilizing cisterns, do not have any form of treatment at all. Six residents did not disclose whether they had a treatment system or not. Most residences had more than one treatment system component. Many combinations of treatment system components were observed. The number of residences with each type of treatment system component are summarized as follows:

- 101 residences utilize filtration
- 77 residences utilize chlorination dispensed by a chemical mixer
- 64 residences utilize activated carbon systems
- 61 residences utilize a separate treatment system for drinking water sources, of which 39 utilize reverse osmosis systems, and 22 utilize a distillery
- 30 residences utilize water softening systems
- 12 residences utilize Ultra-Violet light disinfection systems
- 6 residences utilize Alum chemical mixing systems.

None of the residents contacted for the questionnaire mentioned that they utilized heat pumps. Heat pumps were not observed during the sampling program.

Most residents were pleased with the treated water quality from their treatment systems.

A list of residence identifiers and whether or not a treatment system is utilized is found in Appendix IV.

### 4.3.1.3 Water Usages

Of the 173 households that use river water, a total of 100 residences utilizing shorewells or waterlines use the Niagara River water as their potable water supply. Two of these residences do not utilize treatment systems. The other 73 residences use commercially bottled water, or bottled municipal water for their potable water supply. Residences using the water obtained from the Niagara River without treatment as a potable water source are listed in Appendix IV.

One shorewell (1-258) is used by a food processing plant, and four shorewells are used by institutions. One institution (1-37) utilizes two shorewells, which supply approximately 225 full time residents and support staff. The other institution (1-38) utilizes two shorewells which supply approximately 12 residents and support staff.

There are 4 motels/cabins located along the Niagara River Parkway which have seasonal occupants and utilize shorewells for their potable water source. One marina utilizes a waterline for its potable water supply. One campground utilizes a shorewell for its potable water supply.

A total of 34 unused shorewells were observed, during the walking reconnaissance survey, between Service Road 1 and the end of Service Road 3. This area is now on the municipal water system. These shorewells were installed before the Town of Fort Erie extended the watermain to the end of Service Road 3, the current Northern limit of the municipal water system (see Figure 7). Unused systems of this sort should be either properly abandoned (by law) or maintained to ensure suitability when needed. Most residences remain connected to these shorewells to provide an emergency water supply or to be used for irrigation.

TABLE 1 - Summary of Findings for Section A

| | | |
|---|---|---|
| number of residences | 216 | |
| number of respondents | 181 | |
| no. of shorewells (questionnaire) | 134 | |
| no. of additional shorewells (observed) | 13 | |
| no. of waterlines | 12 | |
| no. of treatment systems | 131 | |
| no. of cisterns | 11 | |
| no. of deep wells | 1 | |
| no. of shared wells | 10 | (37 residences) |

### 4.3.2 CHIPPAWA CREEK (SECTION B)

There were two shorewells observed in Chippawa Creek. One shorewell (2-9) is used to fill a cistern, which stores the water until required as a domestic supply. The water passes through a treatment system which utilizes a filtration system, a water softener system and an Ultra-Violet (UV) light disinfection system. The other shorewell (2-10) is used only as an irrigation source for a golf course. The clubhouse for this golf course is supplied by the Niagara Falls municipal waterline.

There were several industrial intakes (Norton Advanced Ceramics of Canada Incorporated; Washington Mills Electro-Minerals Corporation of Canada) and Regional Niagara water supply located along the Chippawa Creek.

The locations of the shorewells and the industrial and Regional Niagara water intakes for the Regional water treatment plants are shown in Figure 8.

### 4.3.3 LOWER NIAGARA RIVER (SECTION C)

The locations of the shorewell, waterlines, and pipelines are shown on Figure 9.

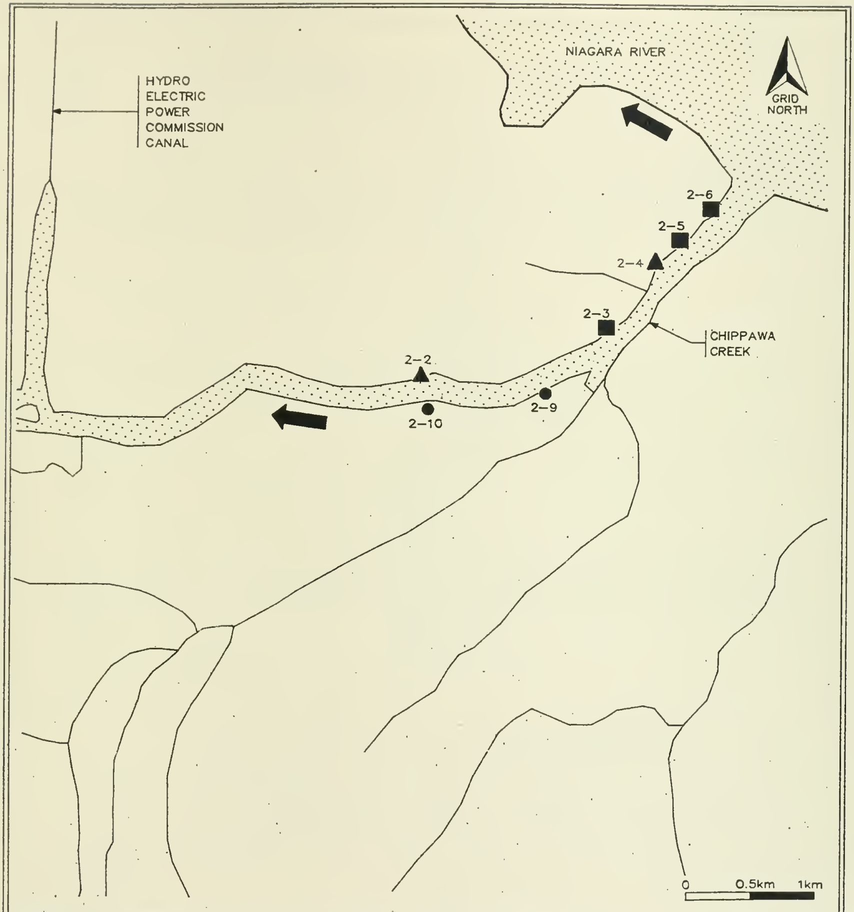
One shorewell, used for irrigation of lawns and flower beds, was observed in the lower Niagara River (Section C). The shorewell was winterized at the time of investigation. Therefore, water samples could not be obtained.

There were four 38 mm to 50 mm (1½ inch to 2 inch) waterlines observed along the bank of the lower Niagara River. These waterlines were dismantled at the time of investigation (winterized).

There were six large diameter, approximately 150 mm to 200 mm (6 inch to 8 inch), waterlines on the bank of the river. All of these waterlines were dismantled at the time of the investigation. The owners of the waterlines were contacted by telephone. It was verified that these waterlines are all used for irrigation of agricultural land, orchards and nurseries during dry periods.

Two of these waterlines are registered with the MOEE (Permit to Take Water number 76-2061-M and 72-359-M).

No water samples were obtained from Section C.



LEGEND

← FLOW DIRECTION

▲ INDUSTRIAL INTAKE
2-2 IDENTIFICATION

■ REGIONAL WATER SUPPLY INTAKE
2-3 IDENTIFICATION

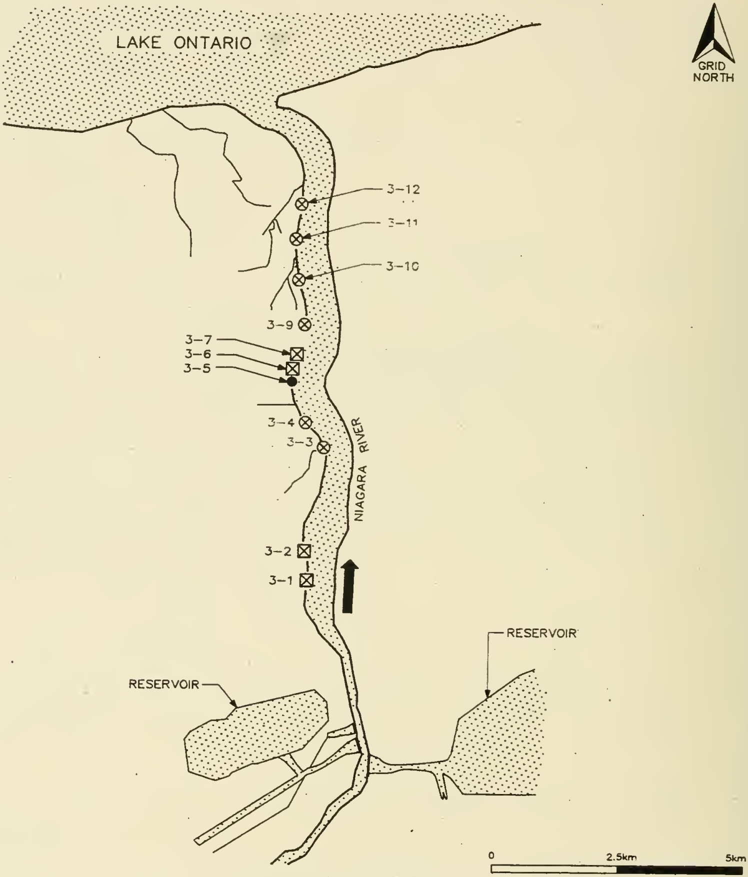
● SHOREWELL
2-9 IDENTIFICATION

LOCATION MAP OF PUMPING POINTS
"SECTION B"
NIAGARA RIVER SHOREWELLS

CLIENT
Ministry of the Environment and Energy
Ontario

ARCTURUS

| | | | |
|---|---|---|---|
| DATE FEBRUARY 1993 | | PROJECT No. E343.0 | DRAWING No. |
| DRWN TVL | CHK'D AMA | SCALE 1:35000 | FIGURE 8 |



LEGEND

| | |
|---|---|
| ⬅ | FLOW DIRECTION |
| ☒<br>3-1 | 50mm WATERLINE IDENTIFICATION |
| ⊗<br>3-3 | 150mm OR GREATER PIPELINE IDENTIFICATION |
| ●<br>3-5 | SHOREWELL IDENTIFICATION |

LOCATION MAP
OF PUMPING
POINTS
"SECTION C"
NIAGARA RIVER
SHOREWELLS

CLIENT
Ministry
of the
Environment
and Energy
Ontario

ARCTURUS

| | | | |
|---|---|---|---|
| DATE FEBRUARY 1993 | | PROJECT No. E343.0 | DRAWING No. |
| DRWN TVL | CHK'D AMA | SCALE 1:90000 | FIGURE 9 |

## 4.4 ANALYTICAL RESULTS

### 4.4.1 BACTERIOLOGICAL RESULTS

A total of 95 bacteriological samples, obtained from 75 residences and institutions along the Niagara River and Chippawa Creek, were submitted for analysis. Of these, a total of 28 bacteriological samples were obtained from untreated water sources. Thirteen of the untreated water samples were re-sampled from treated water sources. Seven duplicate samples and one trip blank sample were submitted with blind numbers. Appendix VI shows the analytical results for all of the bacteriological samples. The locations of the samples are shown on Figure 7 for Section A and Figure 8 for Section B.

The bacteriological results are found in Appendix VI.

### 4.4.2 GENERAL CHEMISTRY PARAMETER RESULTS

The water of twenty treatment systems were sampled both before and after treatment. The location of each system sampled is shown on Figure 10 for Section A, and Figure 8 for Section B.

For QA/QC, duplicate samples were submitted for both the treated and the untreated water. One trip blank was also submitted for analysis.

The analytical results for general chemistry parameters and metals are found in Appendix VII.

The analytical results for organic and pesticide parameters are found in Appendix VIII.

Water samples obtained from sources in Section A (upper Niagara River) are identified as 1-XXXX. Water samples obtained from sources in Section B (Chippawa Creek) are identified as 2-XXXX. All samples obtained from untreated sources are identified by the capital letter "A". All samples obtained from treated sources are identified by the capital letter "B".

## 4.5 GENERAL CONCERNS OF RESIDENTS

Some of the stated concerns of the residents were:

- some residents wish to have their water system replaced with municipal water services
- some residents do not wish to have municipal water
- the treated water is not fit to drink
- the water becomes turbid after storms, when the wind blows from the east, or after periods of meltwater run-off
- two residents expressed a concern that zebra mussels could get into their intake pipes
- siltation of the shorewells.

# 5.0 DISCUSSION OF FINDINGS

## 5.1 BACTERIOLOGICAL ANALYTICAL RESULTS

The Ontario Drinking Water Objectives (ODWO) for total and fecal coliform in drinking water are 10 organisms/100 mL and 0 organisms/100 mL, respectively. The Niagara Regional Health Services Department guidelines for total coliform and fecal coliform in drinking water are 2 organisms/100 mL and 0 organisms/100 mL, respectively. The more stringent local guidelines are used in this investigation due to the fact that the residences located along the Niagara River are under the jurisdiction of the Niagara Regional Health Services Department.

Fecal coliform counts are used as indicators for the presence of fecal material and other co-existing pathogens. Fecal coliform, which is present in sewage or animal wastes, is known to cause diarrhoea, and other gastrointestinal afflictions, even at very low concentrations, whether ingested or due to physical contact as in bathing. Therefore, only a total absence of fecal coliform in the drinking water supply is acceptable under the Niagara Regional Health Services Department drinking water guidelines. Total coliform is used as a general water quality indicator, with higher total coliform concentrations indicating generally worsening water quality.

A statistical summary of the bacteriological results obtained from the 75 different residences is as follows:

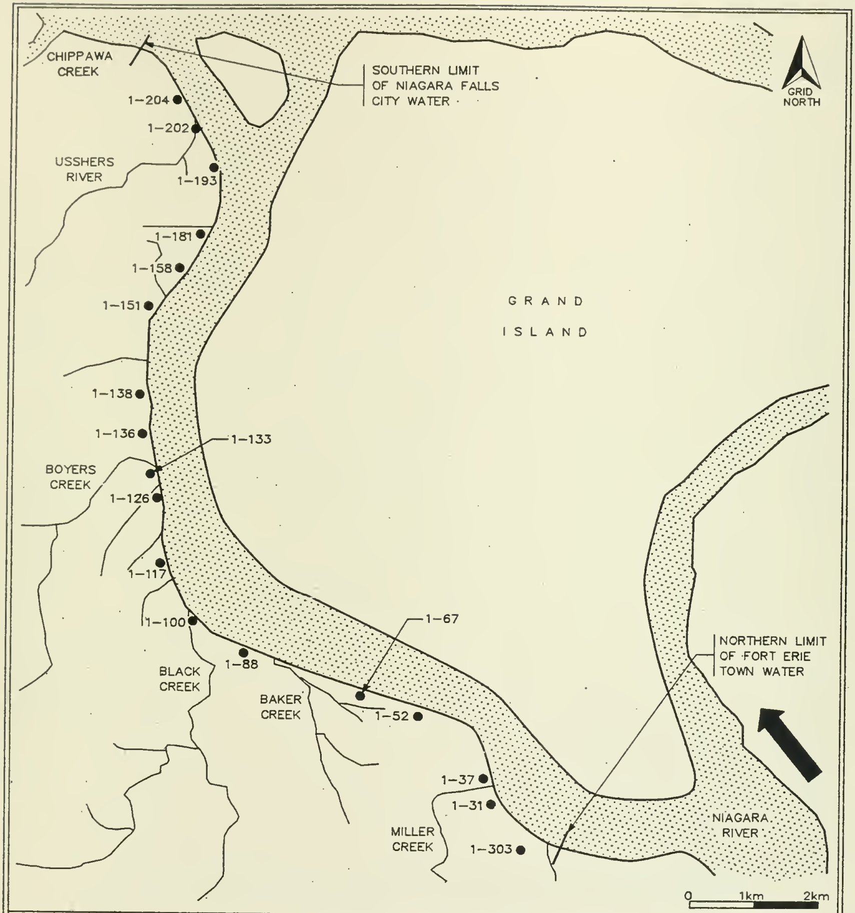
- the geometric mean total coliform reading for the bacteriological samples: 10
- the standard deviation for total coliform: 21
- the number of bacteriological samples which exceeded the guidelines: 31 (41%)

- the geometric mean fecal coliform reading for the bacteriological samples: 3
- the standard deviation for fecal coliform: 7
- the number of bacteriological samples which exceeded the guidelines: 24 (32%).

A histogram depicting the number of occurrences versus total coliform counts is shown on Figure 11. A histogram depicting the number of occurrences versus fecal coliform counts is shown on Figure 12. In both of these histograms the majority of the samples comply with Niagara Regional Health Services Department guidelines.

A considerable number of residents utilize water obtained from Niagara River shorewells that do not comply with the Niagara Regional Health Services Department drinking water guidelines for total coliform and fecal coliform bacteriological parameters.

Table 2 shows a summary of the bacteriological results, indicating the total number of samples, and its subset: the number of samples obtained from treated water supplies and the number of samples obtained from untreated water supplies. Also indicated, are the number of samples which exceeded Niagara Regional Health Services Department guidelines for total and fecal coliform bacteriological samples. The water samples obtained from taps used as the potable water supply, regardless of whether the water supply had undergone treatment are also summarized in Table 2.



LEGEND

| | |
|---|---|
| ⬅ | FLOW DIRECTION |
| ● | SHOREWELL |
| 1–67 | SAMPLE IDENTIFICATION |

GENERAL CHEMISTRY PARAMETER SAMPLES "SECTION A"

NIAGARA RIVER SHOREWELLS

CLIENT
Ministry of the Environment and Energy
Ontario

ARCTURUS

DATE FEBRUARY 1993
DRWN TVL
CHK'D AMA
PROJECT No. E343.0
SCALE 1:70000
DRAWING No.
FIGURE 10

# NIAGARA RIVER SHOREWELL STUDY
# TOTAL COLIFORM COUNTS

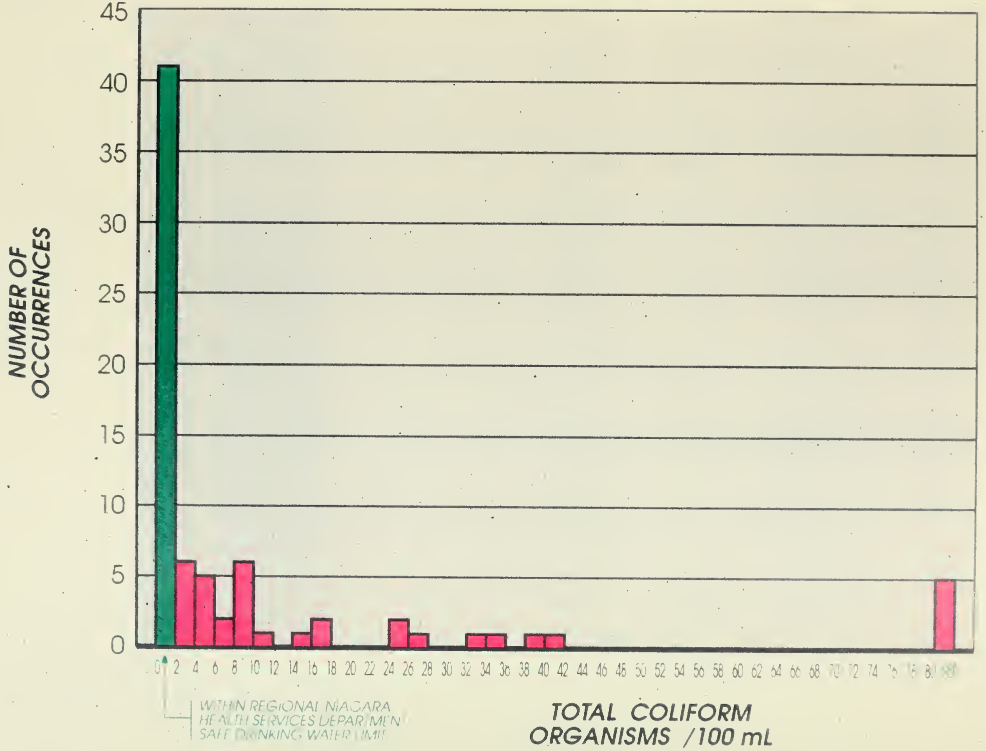


FIGURE 11

# NIAGARA RIVER SHOREWELL STUDY
# FECAL COLIFORM COUNTS

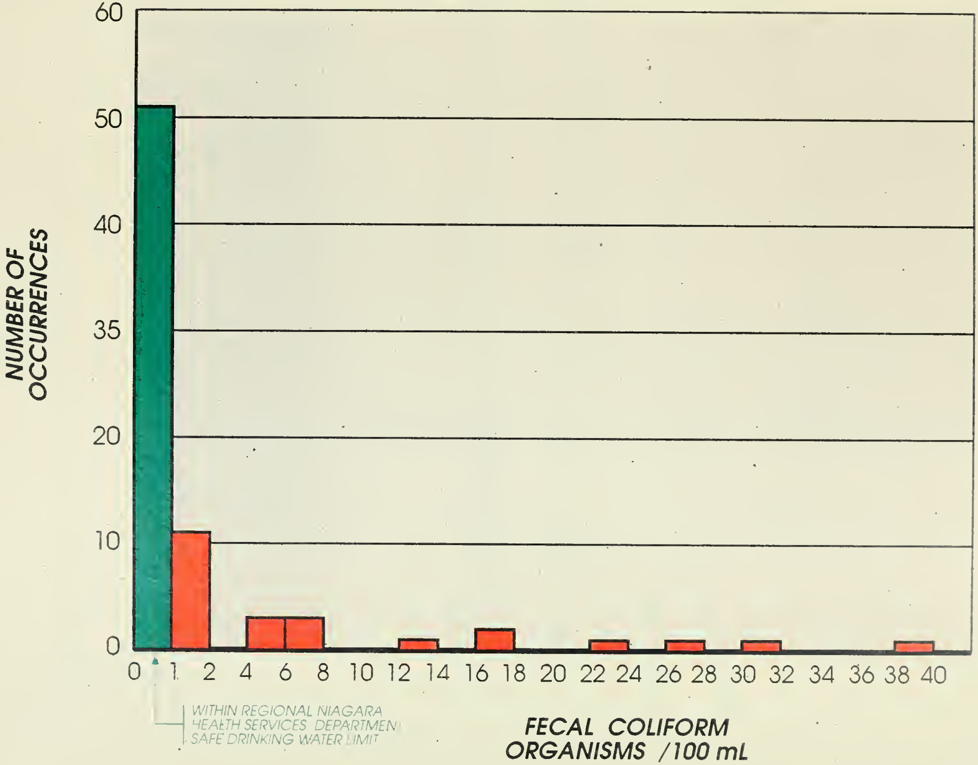


FIGURE 12

Table 2 SUMMARY OF BACTERIOLOGICAL RESULTS

SUMMARY OF BACTERIOLOGICAL SAMPLES EXCEEDING REGIONAL NIAGARA HEALTH SERVICES DEPARTMENT GUIDELINES

| | NUMBER OF SAMPLES | TOTAL COLIFORM | FECAL COLIFORM | BOTH |
|---|---|---|---|---|
| All Samples | 75 | 31 | 23 | 23 |
| Treated | 61 | 20 | 15 | 15 |
| Untreated | 14 | 11 | 8 | 8 |
| Potable* | 43 | 8 | 5 | 5 |

* includes both treated and untreated water sources

The results from the duplicate bacteriological samples (Appendix VI) were generally statistically similar, with minor exceptions. This discrepancy can be attributed to a typical inhomogeneous grouping of bacteriological constituents.

Of the treated water, 20 samples exceeded the Niagara Regional Health Services Department guidelines for total coliform and 15 samples exceeded the guidelines for fecal coliform. These samples were obtained from different treatment systems, (many treatment systems consisted of more than one component) which are listed in Table 3.

A summary of the treatment systems for these samples are outlined as follows:

- 14 samples passed through filtration/conditioning treatment units
  - 6 of the 14 use filtration as the only form of treatment
- 9 samples passed through activated carbon treatment systems
  - 3 of the 9 utilize activated carbon as the only form of treatment systems
- 7 samples passed through chlorination treatment systems
- 4 samples passed through water softening units
  - 1 of the 4 utilizes water softening as the only form of treatment system
- 1 sample passed through an UV disinfecting light unit.

Four bacteriological samples were obtained from residences utilizing an UV component in their treatment systems. The analytical results indicated satisfactory disinfection in three of the four samples.

Table 3 - TREATMENT SYSTEMS FOR WATER SAMPLES EXCEEDING NIAGARA REGIONAL HEALTH SERVICES DEPARTMENT GUIDELINES.

| Sample Identification | Total Coliform | Fecal Coliform | Treatment System |
|---|---|---|---|
| 1-2 | 10 | 2 | Activated Carbon, Chlorination |
| 1-7 | >80 | 28 | Filtration, Chlorination |
| 1-12 | >80 | 24 | Filtration |
| 1-14 | 9 | 2 | Filtration |
| 1-20 | >80 | 40 | Filtration |
| 1-22 | 7 | 2 | Filtration |
| 1-31B | 12 | 0 | Filtration |
| 1-32 | 18 | 1 | Filtration, Activated Carbon |
| 1-54 | 39 | 5 | Filtration, Chlorination |
| 1-77 | 3 | 1 | Activated Carbon, Chlorination |
| 1-111 | 6 | 0 | Filtration, Chlorination |
| 1-123 | 16 | 0 | Water Softener |
| 1-126 | 26 | 7 | Filtration, Chlorination, Water Softening |
| 1-133B | 3 | 1 | Filtration |
| 1-144 | 25 | 8 | Filtration |
| 1-147 | 6 | 0 | Activated Carbon |
| 1-151 | 9 | 5 | Activated Carbon |
| 1-186 | 5 | 1 | Filtration, Activated Carbon, Chlorination |
| 1-204B | 10 | 7 | Filtration, Activated Carbon, Water Softener |
| 1-211 | 3 | 0 | Filtration, Activated Carbon, Ultra-Violet Light, Water Softener |

The source of the high coliform occurrences has not been identified at this time. Possible bacterial sources include, but are not limited to the following:

- saturated soil conditions causing septic fields to pond and contaminate surficial pathways to the Niagara River
- waterfowl
- runoff entering the river
- upstream sewage treatment plants, storm sewers and combined sewer overflows.

The treatment systems for water samples not exceeding the Niagara Regional Health Services Department are listed in Table 4. It can be noted that treatment systems containing a distillery, or reverse osmosis systems did not contain elevated counts of total coliform and fecal coliform organisms.

The more effective treatment systems contained three different treatment components (i.e. filtration, activated carbon, chlorination, etc.). However, there existed anomalous occurrences, ie. systems possessing three components which nonetheless had bacteriological concerns. These anomalies may be attributed to poor treatment system maintenance.

TABLE 4 TREATMENT SYSTEMS FOR WATER SAMPLES NOT EXCEEDING NIAGARA REGIONAL HEALTH SERVICES DEPARTMENT. ALL VALUES IN organisms/100 mL.

| SAMPLE # | TOTAL COLIFORM | FECAL COLIFORM | TREATMENT SYSTEM |
|---|---|---|---|
| 1-303 | 0 | 0 | Activated Carbon |
| 1-37B | 0 | 0 | Filtration, Chlorination, Chemical Treatment |
| 1-38 | 0 | 0 | Chlorination |
| 1-40 | 0 | 0 | Filtration, Activated Carbon, Chlorination |
| 1-44 | 0 | 0 | Distillery |
| 1-46 | 0 | 0 | Filtration, Activated Carbon, Chlorination |
| 1-51 | 0 | 0 | Filtration, Activated Carbon, UV disinfection, Water Softener |
| 1-52 | 0 | 0 | Filtration, Chemical Treatment, Distillery |
| 1-58 | 0 | 0 | Filtration, Activated Carbon, UV disinfection |
| 1-66 | 0 | 0 | Filtration, Activated Carbon, Chlorination, Reverse Osmosis |
| 1-67B | 2 | 0 | Filtration, Activated Carbon, Chlorination, Reverse Osmosis |
| 1-88 | 0 | 0 | Filtration, Activated Carbon, Chlorination, Water Softener |
| 1-90 | 0 | 0 | Filtration, Distillery, Water Softener |
| 1-95 | 0 | 0 | Filtration, Activated Carbon, Chlorination, Reverse Osmosis |
| 1-97B | 0 | 0 | Filtration, Activated Carbon, Chlorination |
| 1-100B | 0 | 0 | Filtration, Activated Carbon, UV disinfectant |
| 1-113B | 0 | 0 | Filtration, Activated Carbon, Chlorination, Distillery, Chemical Treatment |
| 1-116 | 0 | 0 | Filtration, Activated Carbon, Chlorination, Reverse Osmosis, Water Softener |
| 1-117 | 0 | 0 | Filtration, Chlorination, Reverse Osmosis, Water Softener |
| 1-256 | 0 | 0 | Filtration, Activated Carbon, Chlorination, Water Softener |
| 1-130 | 0 | 0 | Filtration, Activated Carbon, Distillery |
| 1-257 | 0 | 0 | Filtration, Chlorination, Reverse Osmosis |
| 1-136B | 0 | 0 | Filtration, Chlorination, Reverse Osmosis |
| 1-138B | 2 | 0 | Filtration, Activated Carbon, Chlorination, Water Softener |
| 1-140 | 2 | 0 | Filtration, Chlorination |
| 1-155 | 0 | 0 | Chlorination, Reverse Osmosis |

TABLE 4 (Cont'd) TREATMENT SYSTEMS FOR WATER SAMPLES NOT EXCEEDING NIAGARA REGIONAL HEALTH SERVICES DEPARTMENT GUIDELINES. ALL VALUES IN organisms/100 mL.

| SAMPLE # | TOTAL COLIFORM | FECAL COLIFORM | TREATMENT SYSTEM |
|---|---|---|---|
| 1-158 | 0 | 0 | Filtration, Chlorination, Reverse Osmosis |
| 1-162 | 0 | 0 | Filtration, Activated Carbon, Chlorination, Distillery, Reverse Osmosis |
| 1-170 | 0 | 0 | Filtration, Chlorination, Reverse Osmosis |
| 1-174 | 0 | 0 | Distillery |
| 1-181B | 0 | 0 | Chlorination |
| 1-182 | 0 | 0 | Filtration, Activated Carbon, Reverse Osmosis |
| 1-190 | 0 | 0 | Filtration, Activated Carbon, Chlorination, Reverse Osmosis |
| 1-192 | 0 | 0 | Filtration, Activated Carbon, Chlorination, Reverse Osmosis, Water Softener |
| 1-193 | 0 | 0 | Filtration, Activated Carbon, Chlorination, Distillery, Reverse Osmosis |
| 1-196 | 0 | 0 | Filtration, Activated Carbon, Reverse Osmosis, Water Softener |
| 1-199 | 1 | 0 | Filtration |
| 1-202B | 0 | 0 | Filtration, Chlorination, Water Softener |
| 1-203B | 0 | 0 | Filtration, Activated Carbon, Chlorination, Water Softener |
| 1-206 | 0 | 0 | Filtration, Activated Carbon, Chlorination, Reverse Osmosis, Water Softener |
| 2-9 | 0 | 0 | Filtration, UV disinfectant, Water Softener |

## 5.2 METAL AND GENERAL CHEMISTRY ANALYTICAL RESULTS

### 5.2.1 METAL ANALYTICAL RESULTS

The metal analytical results are presented in Appendix VII. In general, the water quality is good. All treated samples complied with the ODWO criteria for metals.

Three untreated water samples (1-37A, 1-136A, and 1-193A) out of a possible 44 samples, exceeded the ODWO criterion for iron.

One untreated water sample (1-193A) exceeded the ODWO criterion for manganese. The treated water sample from the same residence complied with the ODWO criterion for manganese.

All untreated and treated water samples complied with the ODWO criteria for copper, lead, zinc, arsenic, cadmium, chromium, mercury and selenium. Mercury analysis requires special containers and preservatives not provided at the outset of the study. Consequently, some of the initial samples were not analyzed for mercury.

### 5.2.2 GENERAL CHEMISTRY ANALYTICAL RESULTS

The general chemistry results are presented in Appendix VII. There is no ODWO criterion for conductivity. The conductivity ranged from 4 $\mu$S (trip blank) to 2260 $\mu$S (1-67A). There was generally an increase in conductivity from the untreated water sample to the treated water sample, likely due to headspace $CO_2$ content. Five samples (1-52B, 1-67B, 1-100B, 1-136B and 1-151B) showed approximately an order of magnitude decrease from untreated water samples to treated water samples. In every case, these treated water samples were obtained from either a distillery or a reverse osmosis system. Some treated water samples increased in conductivity from the untreated water samples. This may be caused by the water softeners.

The ODWO criterion for hardness (as $CaCO_3$) is 80 - 100 mg/L. This value is recommended to obtain the maximum benefit from the treatment system. None of the 44 samples analyzed met this criteria. A total of 12 samples were below the ODWO range. Two samples (1-158B and 1-88B) were below the hardness detection limit of 0.2 mg/L. A total of 32 samples were above the ODWO range. Four samples (1-67A, 1-136A, 1-204A and 1-204B) contained a hardness concentration of greater than 375 mg/L. Of these four, two samples (1-67A and 1-204A) contained a hardness concentration of greater than 620 mg/L.

The average hardness concentration for the untreated water samples was 237 mg/L. The average hardness concentration for the treated water samples was 78 mg/L.

The ODWO criterion for sodium is 200 mg/L. One untreated water sample (1-67A) and one treated water sample (1-204B) exceeded the ODWO criterion for sodium. A total of 7 sample pairs (untreated and treated water) increased in sodium concentration from untreated water to treated water samples. Of the 7 samples, 6 were obtained after a water softener system which would contribute to the sodium concentrations in these samples.

The ODWO criterion for alkalinity is 30 - 500 mg/L (as $CaCO_3$). All of the samples were within this range with the exception of five treated water samples (1-52B, 1-67B, 1-100B, 1-136B, 1-151B) which were below the ODWO alkalinity criterion. All of these samples were obtained from either a distillery or reverse osmosis system.

The ODWO criterion for pH is 6.5 - 8.5. Two treated samples (1-52B, 1-151B) were below the ODWO range for pH, indicating that the treatment systems at these residences produce a slightly acidic water supply.

The ODWO criterion for chloride is 250 mg/L. Three samples (1-67, 1-204A, and 1-204B) exceeded the ODWO criterion. These shorewells also had high concentrations of sodium. This finding indicates that part of the chloride could have originated from road salt which may have dissolved in melt-water and mixed with shorewell water.

All the untreated and treated water samples complied with the ODWO for the remaining general chemistry criteria.

## 5.3 ORGANIC PARAMETERS

The organic analytical results, including pesticides and herbicides, are presented in Appendix VIII. All water samples contain concentrations either below or slightly above the laboratory detection limits for all 128 parameters. This finding indicates that the water quality is good, for these parameters.

A total of seven samples (1-52B, 1-67A, 1-303A, 1-303B, 1-151B, 1-181B and 2-9A) contained detectable concentrations of pentachlorophenol. Pentachlorophenol is used as an insecticide, general herbicide, a wood preservative and in glues. A maximum concentration of 20 ng/L was encountered, compared to the ODWO criterion for pentachlorophenol of 60,000 ng/L. A duplicate of 1-303A did not contain concentrations of pentachlorophenol above the laboratory detection limits. The duplicate of 1-303B contained similar concentrations of pentachlorophenol as 1-303B. This finding indicates that, at this low level of concentration, the quantifying methods used by the laboratory may not be extremely precise.

Two samples (1-100B and 2-09B) contained detectable concentrations of A-Chlordane and G-Chlordane. Chlordane is an insecticide which does not easily break down. Re-sampling the treated water from this residence confirmed the presence of Chlordane in the treated water samples.

Seven samples (1-37A, 1-37B, 1-52A, 1-136A, 1-151B, 2-09B and 2-10A) contained detectable concentrations of A-BHC (Hexachlorocyclohexane). Sample 1-151B also contains detectable concentrations of G-BHC (Hexachlorocyclohexane). BHC compounds are used as insecticides.

Sample 1-52B contained detectable concentrations of 1,2,4-Trichlorobenzene, 1,2,3,5-Tetrachlorobenzene, 1,2,4,5-Tetrachlorobenzene, Pentachlorobenzene, Hexachlorobenzene and G-BHC (Hexachloroclyclohexane). Isomeric mixtures of trichlorobenzene are used in insecticides to combat termites and are also used as degreasing solvents. 1,2,3,5-Tetrachlorobenzene is used as an intermediate in the production of herbicides, defoliants and fungicides. Pentachlorobenzene is used as an intermediate for the production of pesticides.

Two plasticizers, Di-n-Butylphthalate and Bis (2-Ethylhexl) Phthalate demonstrated concentrations above the laboratory detection limits in many samples, but only in samples where the blank showed concentrations of these substances present. Blanks for these two parameters were run for every sample to verify the concentrations of these parameters in the samples. A total of twenty samples contained concentrations of Di-n-butylphthalate and twenty six samples contained concentrations of Bis (2-Ethylhexl) Phthalate, which were above laboratory detection limits. Phthalates (plasticizers) can be encountered in many places including any plasticized surface the water contacts.

All water samples, except ten (1-67A, 1-67B, 1-100B, 1-136B, 1-181B, 1-202B, 1-204A, 1-204B, 1-303B and the trip blank) contained detectable concentrations of Atrazine. The maximum concentration encountered was 140 ng/L (ppt - parts per trillion) compared to the ODWO criterion for Atrazine of 60,000 ng/L. Atrazine is a selective herbicide.

## 5.4 SUMMARY

Approximately 42 % of all bacteriological samples obtained exceeded the Niagara Regional Health Service Department guidelines for total coliform. Approximately 31 % of all bacteriological samples obtained exceeded the Niagara Regional Health Services Department guidelines for fecal coliform. These results indicate that there is a potential health risk from bacteria to the people who take drinking water from shorewells or waterlines in the Niagara River.

The general chemistry analyses indicate that the treated water quality is generally good. The exceptions to this is the treated water sample which exceeded the sodium objectives and the three water samples which exceeded the chloride objectives.

The organic water analyses indicate that all the water samples represent good water quality. None of the samples exceeded the Ontario Drinking Water Objectives for any parameter.

The pesticide analyses indicate that all the water samples represent good water quality. None of the samples exceeded the Ontario Drinking Water Objectives for any parameter.

# APPENDIX I

## GENERAL CHEMISTRY PARAMETERS

## APPENDIX I GENERAL CHEMISTRY PARAMETERS

COPPER
NICKEL
LEAD
ZINC
IRON
MANGANESE
ARSENIC
CADMIUM
CHROMIUM
MERCURY
SELENIUM

CONDUCTIVITY
(@ 25 degrees C)
HARDNESS (CaCO$_3$)
CALCIUM
MAGNESIUM
SODIUM
POTASSIUM
ALKALINITY
pH
CHLORIDE
SULPHATE
NITROGEN (TOTAL KJELDAHL)
AMMONIUM NITROGEN
NITRATES
NITRITES

ION BALANCE CALC.
TOTAL POS. IONS
TOTAL NEG. IONS
EST. DISS. SOLIDS
EST. CONDUCTIVITY

## APPENDIX I (cont'd) ORGANIC WATER (OWCP, OWOC, OWTRI)

2,4,5-TRICHLOROPHENOL
2,3,4-TRICHLOROPHENOL
2,3,5,6-TETRACHLOROPHENOL
2,3,4,5-TETRACHLOROPHENOL
PENTACHLOROPHENOL
DICAMBA
2,4,D-PROPIONIC ACID
2,4-DICHLOROPHENOXYACETIC
SILVEX
2,3,5-TRICHLOROPHENOXYACETIC
2,4-DICHLOROPHENOXYBUTYRC
PICLORAM
AMETRYNE
PROMETONE
PROPAZINE
ATRAZINE
PROMOTRYNE
SIMAZINE
SENCOR
BLADEX
ATRATONE
DETHYLATED ATRAZINE
METOLACHLOR
LASSO
DIETHYL SIMAZINE
HEXACHLOROETHANE
1,3,5-TRICHLOROBENZENE
1,2,4-TRICHLOROBENZENE
HEXACHLOROBUTADIENE

1,2,3-TRICHLOROBENZENE
2,4,5-TRICHLOROTOLUENE
2,3,6-TRICHLOROTOLUENE
1,2,3,5-TETRACHLOROBENZENE
1,2,4,5-TETRACHLOROBENZENE
2,6,A-TRICHLOROTOLUENE
1,2,3,4-TETRACHLOROBENZENE
PENTACHLOROBENZENE
PCB (total)
HEXACHLOROBENZENE
HEPTACHLOR
ALDRIN
PP-DDE
MIREX
A-BHC HEXACHLOROCYCLOHEXANE
B-BHC HEXACHLOROCYCLOHEXANE
G-BHC HEXACHLOROCYCLOHEXANE
A-CHLORDANE
G-CHLORDANE
OXYCHLORDANE
OP-DDT
PP-DDD
PP-DDT
DMDT METHOXYCHLOR
HEPTACHLOREPOXIDE
ENDOSULFAN I
DIELDRIN
ENDRIN
ENDOSULFAN II

ENDOSULFAN SULPHATE
OCTOCHLOROSTYRENE
TOXAPHENE
DIAZINON
DICHLOROVOS
DURSBAN
ETHION
GUTHION
MALATHION
MEVINPHOS
METHYLPARATHION
METHYLTRITHION
PARATHION
PHORATE (THIMET)
RELDAN
RONNEL
AMINOCARB
BENOMYL
BUX
CARBOFURAN
CIPC
DIALLATE
EPTAM
IPC
PROPOXUR
SEVIN
SUTAN
HEXACHLOROCYCLOPENTADIENE

## PESTICIDES-EFFLUENT (PECAR, PEOP)

BENZO (g, h, i) PERYLENE
BIS (2-CHLOROISOPROPYL) ETHER
BIS (2-CHLOROETHOXY) METHANE
NAPTHALENE
ACENAPHTHYLENE
2,6-DINITROTOLUENE
ACENAPHTHENE
4-CHLOROPHENYLPHENYLETHER
2,4-DINITROTOLUENE
FLUORENE
N-NITROSODIPHENYLAMINE
4-BROMOPHENYL PHENYL ETHER
PHENANTHRENE
ANTHRACENE
Di-n-BUTYLPHTHALATE
FLUORANTHENE
PYRENE
BUTYLBENZYLPHTHALATE
BENZO (a) ANTHRACENE
CHRYSENE
BIS-(2-ETHYLHEXYL) PHTHALATE
Di-n-OCTYLPHTHALATE
BENZO (k) FLUORANTHENE
BENZO (a) PYRENE
INDENO (1,2,3-cd) PYRENE
DIPHENYLAMINE
3,3-DICHLOROBENZIDINE
BIS (2-CLOROETHYL) ETHER
CAMPHENE
DIPHENYL ETHER
N-NITROSODI-N-PROPYLAMINE
1-CHLORONAPHTHALENE
1-METHYLNAPHTHALENE
2-CHLORONAPTHALENE
2-METHYLNAPHTHALENE
5-NITROACENAPHTHENE
BENZO (B) FLUORANTHENE
BIPHENYL
INDOLE
PERYLENE

# APPENDIX II

## RESIDENT QUESTIONNAIRES

# NIAGARA SHORE WELL QUESTIONNAIRE

Arcturus Environmental Limited in Niagara Falls has been contracted by the Ministry of the Environment and Energy to conduct a survey on the shore wells located along the Niagara River. This survey involves obtaining as much information as possible about the shore wells and the number of people who use them. The following questions have been reviewed by the Ministry of the Environment and Energy and are considered relevant to the information required. Therefore we ask that all questions be answered if possible

All information will be treated in the strictest of confidence and will only be forwarded to the Ministry of the Environment and Energy.

Date Completed: ____________________

1a. What are the name(s) of the owners of this residence? ____________________________

1b. What is the address of this residence? ____________________

____________________

____________________

1c. How many permanent occupants are there in the residence? ________

1d. How many seasonal occupants are there in the residence? _________

2a. What is the source of water for this residence (well, municipal water, trucked in water, other)?

_______________

2b. (If a well) Where is the well located? (between house and road; between road and river; in river; on river bank; other)

______________________________________________________________

## PURPOSE OF WATER SUPPLY (CHECK WHERE APPROPRIATE)

3a. What is the water from the shorewell used for?

_____ Domestic (bath, laundry) _____ Potable (drinking, cooking)

_____ Livestock watering _____ Irrigation _____ Not used

_____ Other (explain) ______________________________

3b. Is there a secondary water supply? _____ Yes _____ No

If so, please specify:

_____ Ponded water

_____ Another well

_____ Municipal supply

_____ Other (explain) ______________________________

3c. Do you know of any other users of this particular well? _____ Yes _____ No

3d. (if yes) How many households use this well? __________

3e. What are the names of the other users? ____________________________________________________

______________________________________________________________________________

3f. Do you have a permit from the MOE to take water (required only for >50,000 L/day)? _____Yes _____ No

3g. Do you have any other permits with regard to water use? _____ Yes _____ No

## WELL INFORMATION

4a. Do you know when the well was constructed? ____________________________

4b. Do you know the name of the contractor? ____________________________

4c. Method of construction (check where appropriate)

_____ drilled _____ dug or bored _____ combination

4d. Have there been any occurrences of the following at the shorewell? (please check)

_____ erosion _____ flooding _____ siltation

4e. What is the approximate age of the pump? greater than 15 years _____ less than 15 years _____

4f. What is the history or maintenance frequency of the well and pump ______________________________

________________________________________________________________________

________________________________________________________________________

## WATER TREATMENT

5a. Is the water treated in any manner whether it is filtration, water softening, or chlorination?
___ Yes ___ No

5b. Type of treatment systems:

_____ activated carbon
_____ filtration
_____ chlorination
_____ untreated
_____ distilled
_____ osmosis
_____ water softener
_____ UV
_____ other

5c. What is the frequency of maintenance of the treatment system? ______________________________

________________________________________________________________________

________________________________________________________________________

## WATER QUALITY

(combination of following parameters taste, colour, odour, mineral content, etc.)

6a. How would you describe the water quality.

6b. Is the water clear, or is it cloudy? ______________________________________________
6c. Does it have any taste? ______________________________________________________

6d. Does it have any odour? _____________________________________________________

6e. Does the water have any noticeable colour (yellow, brown, green)? ____________________

6f. Is there any significant mineral content of the water (iron, nitrate, sulphate)? ______________

6g. Does the water stain porcelain fixtures? ______ yes ______ no

6h. Is your cold water cold enough for your personal taste in the summer? _____ yes ____ no

6i. Any other comments: ____________________________________________

____________________________________________

____________________________________________

____________________________________________

Another part of this survey will involve obtaining water samples from your shorewell. We need to arrange this when somebody is there so that we may obtain samples of your drinking water from the tap and be able to ask any questions should they arise. Our field technicians will answer any questions you might have regarding the survey or the sampling procedures.

7a. If you are unable to be present when we will be sampling (in January 1993), would you allow us to take a water sample from your well and from an outdoor tap. _____ yes _____ no

7b. Is there a tap from which we may sample untreated water. _____ yes _____ no

(If yes) where is it located? ____________________________________________

(We understand that you will have to be present if we are sampling an indoor tap.)

7c. Comments: ____________________________________________

____________________________________________

8a. If you have any questions about this survey, feel free to call:

Mr. Edward Lorek
Project Manager
Arcturus Environmental Limited
7900 Canadian Drive
Niagara Falls, Ontario
L2E 6S5

Mr. Lorek can be contacted at (416)357-6424, extension 21.

All information received from this survey will be treated as confidential and will only be released to the MOE. A copy of the data obtained from your well and a comparison to Ontario Drinking Water Guidelines will be forwarded to you at the completion of this survey.
Thank you for your co-operation and your time.

NIAGARA SHORE WELL QUESTIONNAIRE (To be used in addition to the original phone survey)

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All information will be treated in the strictest of confidence, we will only be forward the information to the Ministry of the Environment and Energy.

PART A (TO BE COMPLETED WITH OWNER)

Arcturus would like to obtain a sample of untreated water from your access port. We will send you a copy of the data obtained from your water and a comparison to Ontario Drinking Water Guidelines at the completion of this survey.

Date Completed: ____________________

Completed By : ____________________

1a. What is the mailing address of this residence? ____________________
____________________
____________________

1b. To whom shall the results be addressed? ______________________________

1c. Name of person interviewed? ____________________________________

WATER TREATMENT

2a. Is the water treated in any manner whether it is filtration, water softening, or chlorination?
___ Yes ___ No

2b. Type of treatment systems:

|  |  |  |
|---|---|---|
| ____ activated carbon | ____ untreated | ____ water softener |
| ____ filtration | ____ distilled | ____ UV |
| ____ chlorination | ____ osmosis | ____ other |

3a. Is there a tap from which we may sample untreated water. _____ yes _____ no

(If yes) where is it located?____________________

3b. Sample taken from: tap ______.

4a. Have you any complaints of water quality or quantity?____________________________________

____________________________________________________________________

SAMPLES TAKEN

UNTREATED WATER

_____ total coliform bacteria

_____ fecal coliform bacteria

UNTREATED WATER

Parameter Group (WCGWIB)

_____ total kjeldahl nitrogen

_____ ammonia nitrogen

_____ nitrate nitrogen

_____ nitrite nitrogen

_____ iron

_____ manganese

_____ hardness

_____ calcium

_____ ionic balance calculation

_____ magnesium

_____ sodium

_____ potassium

_____ alkalinity

_____ chloride

_____ sulfate

_____ pH

_____ conductivity

UNTREATED WATER

_____ OWOC organochlorine pesticides

_____ PECAR - carbaryl

_____ PEOP - organo phosphate pesticides

_____ OWCP - chlorophenols

_____ MISA 19 - MISA base/neutral extractable organics

_____ HMPPI - priority metal

_____ chlorobenzenes

TREATED WATER

_____ OWOC organochlorine pesticides

_____ PECAR - carbaryl

_____ PEOP - organo phosphate pesticides

_____ OWCP - chlorophenols

_____ MISA 19 - MISA base/neutral extractable organics

_____ HMPPI - priority metal

_____ chlorobenzenes

Comments that were expressed by the landowner/tenant regarding the questionnaire, sampling, and project.

Explain ______________________________________________________________

______________________________________________________________________

______________________________________________________________________

5a. If you have any questions about this survey, feel free to call collect:

Mr. Edward Lorek
Project Manager
Arcturus Environmental Limited
7900 Canadian Drive
Niagara Falls, Ontario
L2E 6S5

Mr. Lorek can be contacted at (416)357-6424, extension 21.

Mr. Archie McLarty
Senior Project Advisor
Niagara River Improvement Project
Ministry of the Environment and Energy
119 King Street West, 12th Floor
Hamilton, Ontario
L8N 3Z9

Mr. McLarty can be contacted at (416)521-7704.

All information received from this survey will be treated as confidential, will only be released to the MOE. Thank you for your co-operation and your time.

# APPENDIX III

## LIST OF TREATMENT SYSTEMS

## APPENDIX III - TREATMENT SYSTEMS

| I.D. | FILTRATION WATER CONDITION. | ACTIVATED CARBON | CHLORI-NATION | UV | DISTILLERY | REVERSE OSMOSIS | WATER SOFTENER | CHEMICAL TREATMENT | OTHER COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1-1 | X | | | | | | | | sterisol filtering unit |
| 1-2 | | X | X | | | | | | |
| 1-3 | X | | | | | | X | | |
| 1-4 | Treatment system details not disclosed | | | | | | | | system not available in Canada |
| 1-6 | | | | | | X | | | |
| 1-7 | X | | X | | | | | | |
| 1-8 | | | | | | X | | | |
| 1-9 | | | | | X | | | | |
| 1-302 | X | X | X | | | X | | | |
| 1-303 | | X | | | | | | | |
| 1-10 | | | | | X | | | | |
| 1-11 | X | | X | | | | | | |
| 1-12 | X | | | | | | | | |
| 1-252 | X | | X | | X | | | | |
| 1-15 | X | | | | | | | | |
| 1-17 | X | | X | X | | | | | |
| 1-20 | X | | | | | | | | |
| 1-22 | X | | | | | | | | |
| 1-23 | X | | | | | | | | |
| 1-254 | X | X | X | | | X | | | |
| 1-24 | X | | | | | X | | | |
| 1-26 | X | | | | | X | | | |
| 1-31 | | X | | | | | | | |
| 1-32 | X | X | | | | | | | |
| 1-35 | X | X | X | | | | | | |
| 1-37 | X | | X | | | | | X | |
| 1-38 | | | X | | | | | | |
| 1-39 | X | | | X | | X | | | |
| 1-40 | X | X | X | | | | | | ceramic filter for kitchen tap |
| 1-41 | X | X | X | | | | | | |
| 1-43 | X | X | X | | | | | X | |

All distillery and reverse osmosis systems are connected to one tap only (usually kitchen)

APPENDIX III (cont'd) · TREATMENT SYSTEMS

| I.D. | FILTRATION WATER CONDITION. | ACTIVATED CARBON | CHLORI-NATION | UV | DISTILLERY | REVERSE OSMOSIS | WATER SOFTENER | CHEMICAL TREATMENT | OTHER COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1-44 | | | | | X | | | | |
| 1-46 | X | X | X | | | | | | |
| 1-47 | X | X | X | | | X | | | |
| 1-50 | X | | | | X | | | | |
| 1-51 | X | X | | X | | | X | | |
| 1-52 | X | | | | X | | | X | |
| 1-54 | X | | X | | | | | | |
| 1-58 | X | X | | X | | | | | |
| 1-59 | X | | X | | | | | | |
| 1-62 | X | | X | | X | | | | |
| 1-66 | X | X | X | | | X | | | |
| 1-67 | X | X | X | | | X | | | |
| 1-68 | X | X | X | | | | | | |
| 1-69 | | X | X | | | | | | |
| 1-73 | X | X | X | | | | | X | |
| 1-77 | | X | X | | | | | | |
| 1-78 | | X | | | | | | | |
| 1-81 | X | X | | X | | X | | | |
| 1-88 | X | X | X | | | | X | | |
| 1-90 | X | | | | X | | X | | |
| 1-91 | X | X | X | | | | X | | |
| 1-93 | | | X | | | | X | | |
| 1-95 | X | X | X | | | X | | | |
| 1-96 | | | X | | | | | | |
| 1-97 | X | X | X | | X | | X | | |
| 1-99 | X | X | | | | | | | |
| 1-100 | X | X | | X | | | | | |
| 1-111 | X | | X | | | | | | |
| 1-112 | X | | X | | | | X | | |
| 1-113 | X | X | X | | X | | | X | |
| 1-116 | X | X | X | | | X | X | | |

· All distillery and reverse osmosis systems are connected to one tap only (usually kitchen)

APPENDIX III (cont'd) - TREATMENT SYSTEMS

| I.D. | FILTRATION WATER CONDITION. | ACTIVATED CARBON | CHLORI- NATION | UV | DISTILLERY | REVERSE OSMOSIS | WATER SOFTENER | CHEMICAL TREATMENT | OTHER COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1-117 | X | | X | | | X | X | | |
| 1-118 | | | | | | | X | | |
| 1-120 | X | | X | | | X | | | |
| 1-121 | X | | X | | X | | | | |
| 1-123 | | | | | | | X | | |
| 1-124 | X | X | | X | | | | | |
| 1-256 | X | X | X | | | | X | | |
| 1-126 | X | | X | | X | | X | | |
| 1-127 | X | | | | X | | | | system currently not functional |
| 1-128 | X | | X | | | X | | | |
| 1-130 | X | X | | | X | | | | |
| 1-132 | X | X | | | | | | | ESA or ESM system - toxins, colour, odour filters |
| 1-133 | X | | | | | | | | |
| 1-134 | X | X | X | | | X | | | |
| 1-135 | X | X | X | | | X | | | |
| 1-257 | X | | X | | | X | | | |
| 1-136 | X | | X | | | X | | | |
| 1-137 | X | | | | X | | | | |
| 1-138 | X | X | X | | | | X | | |
| 1-140 | X | | X | | | | | | |
| 1-144 | X | | | | | | | | |
| 1-258 | X | X | X | | | | | | |
| 1-147 | | X | | | X | | | | |
| 1-149 | X | | X | | | | | | |
| 1-150 | X | X | X | | | X | | | |
| 1-151 | | X | | | X | | | | |
| 1-153 | X | X | | | | | | | |
| 1-154 | X | | | X | | X | X | | |
| 1-155 | | | X | | | X | | | |
| 1-156 | X | X | X | | | X | X | X | |
| 1-158 | X | | X | | | X | X | | |
| 1-159 | X | X | X | | | X | X | | |
| 1-160 | X | | X | | | | | | |

All distillery and reverse osmosis systems are connected to one tap only (usually kitchen)

APPENDIX III (cont'd) - TREATMENT SYSTEMS

| I.D. | FILTRATION WATER CONDITION. | ACTIVATED CARBON | CHLORI-NATION | UV | DISTILLERY | REVERSE OSMOSIS | WATER SOFTENER | CHEMICAL TREATMENT | OTHER COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1-162 | X | X | X |  | X | X |  |  |  |
| 1-165 | X |  |  | X |  |  |  |  |  |
| 1-167 | X | X | X | X |  |  |  |  |  |
| 1-168 | X | X | X |  |  | X |  |  |  |
| 1-170 | X |  | X |  |  | X |  |  |  |
| 1-172 | X |  |  |  |  |  |  |  |  |
| 1-173 | X |  |  |  |  |  |  |  |  |
| 1-174 |  |  |  |  | X |  |  |  |  |
| 1-175 |  | X |  |  | X |  |  |  |  |
| 1-180 |  |  | X |  |  |  |  |  |  |
| 1-181 |  |  | X |  |  |  |  |  |  |
| 1-182 | X | X |  |  |  | X |  |  |  |
| 1-183 |  |  | X |  |  |  |  |  |  |
| 1-185 | X |  | X |  |  |  |  |  |  |
| 1-186 | X | X | X |  |  |  |  |  |  |
| 1-189 | X | X | X |  |  | X | X |  |  |
| 1-190 | X | X | X |  |  | X |  |  |  |
| 1-191 | X | X | X |  |  |  |  |  |  |
| 1-192 | X | X | X |  |  | X | X |  |  |
| 1-193 | X | X | X |  | X | X |  |  |  |
| 1-196 | X | X |  |  |  | X | X |  |  |
| 1-197 | X | X | X |  |  | X | X |  |  |
| 1-199 | X |  |  |  |  |  |  |  |  |
| 1-200 | X | X | X |  |  |  |  |  |  |
| 1-201 | X |  | X |  |  |  |  |  |  |
| 1-202 | X |  | X |  |  |  | X |  |  |
| 1-203 | X | X | X |  |  |  | X |  |  |
| 1-204 | X | X |  |  |  |  | X |  |  |
| 1-205 |  | X |  |  |  | X |  |  |  |
| 1-206 | X | X | X |  |  | X | X |  |  |

All distillery and reverse osmosis systems are connected to one tap only (usually kitchen)

APPENDIX III (cont'd) - TREATMENT SYSTEMS

| I.D. | FILTRATION WATER CONDITION. | ACTIVATED CARBON | CHLORI-NATION | UV | DISTILLERY | REVERSE OSMOSIS | WATER SOFTENER | CHEMICAL TREATMENT | OTHER COMMENTS |
|---|---|---|---|---|---|---|---|---|---|
| 1-207 | X | X | X | | | X | | | |
| 1-208 | X | | X | | | | X | | |
| 1-210 | | | X | | | | | | |
| 1-211 | X | X | | X | | | X | | |
| 2-9 | X | | | X | | | X | | |

All distillery and reverse osmosis systems are connected to one tap only (usually kitchen)

# APPENDIX IV

## LIST OF RESIDENCES AND SOURCE OF WATER SUPPLY

APPENDIX IV SOURCE OF WATER SUPPLY, NUMBER OF OCCUPANTS, WATER TREATMENT SYSTEM AND AGE OF PUMP.

| RESIDENCE | WATER SUPPLY | NUMBER OF OCCUPANTS | PRIVATE TREATMENT SYSTEM (Y/N) | AGE OF PUMP (YEARS) |
|---|---|---|---|---|
| 1-1 | SHOREWELL | 2 | Y | >15 |
| 1-2 | SHOREWELL | 4 | Y | UNKNOWN |
| 1-3 | SHOREWELL | 2 | Y | <15 |
| 1-4 | SHOREWELL | N/A | Y | <15 |
| 1-5 | SHOREWELL | N/A | N/A | N/A |
| 1-6 | SHOREWELL | 1 (1) | Y | 3 |
| 1-7 | SHOREWELL | N/A | Y | <15 |
| 1-8 | SHOREWELL | 2 | Y | <15 |
| 1-250 | SHOREWELL* | N/A | N/A | N/A |
| 1-9 | SHOREWELL | 2 | Y | >15 |
| 1-301 | SHOREWELL | 1 | N | <15 |
| 1-302 | SHOREWELL | 4 | Y | <15 |
| 1-303 | SHOREWELL | 2 | Y | >15 |
| 1-304 | CISTERN | 3 | N | N/A |
| 1-10 | SHOREWELL | 2 | Y | >15 |
| 1-11 | SHOREWELL | N/A | Y | N/A |
| 1-251 | SHOREWELL | N/A | N/A | N/A |
| 1-12 | SHOREWELL | 2 | Y | 25 |
| 1-252 | SHOREWELL | 3 | Y | N/A |
| 1-13 | SHOREWELL | N/A | N/A | <5 |
| 1-14 | SHOREWELL | 2 | N | N/A |
| 1-15 | CISTERN,WELL | 3 | Y | N/A |
| 1-16 | SHOREWELL | N/A | N/A | N/A |
| 1-17 | SHOREWELL | 3 (3) | Y | N/A |
| 1-18 | SHOREWELL | N/A | N/A | N/A |
| 1-19 | SHOREWELL | N/A | N/A | N/A |
| 1-20 | SHOREWELL | 3 | Y | N/A |
| 1-21 | SHOREWELL | 3 | N/A | N/A |
| 1-253 | SHOREWELL | 4 | N | N/A |
| 1-22 | SHOREWELL | 2 | Y | N/A |
| 1-23 | SHOREWELL | 3 | Y | N/A |
| 1-254 | SHOREWELL | 2 | Y | N/A |
| 1-24 | SHOREWELL | 4 | Y | N/A |
| 1-25 | SHOREWELL | 3 | N | N/A |
| 1-26 | SHOREWELL | 4 | Y | N/A |
| 1-27 | SHOREWELL | 5 | N | N/A |
| 1-255 | WELL, WATERLINE | 1 | N | UNKNOWN |
| 1-28 | WELL, WATERLINE | 2 | N | >15 |
| 1-29 | N/A | N/A | N/A | N/A |
| 1-30 | CISTERN | N/A | N | N/A |
| 1-31 | SHOREWELL | 2 | Y | <15 |
| 1-32 | SHOREWELL | 2 | Y | <15 |
| 1-33 | N/A | N/A | N/A | N/A |
| 1-34 | N/A | N/A | N/A | N/A |
| 1-35 | WATERLINE | N/A | Y | >15 |

N/A - data not available
SHOREWELL* - shorewell observed, data not available
2(4) - two permanent occupants with two additional seasonal occupants
CISTERN, WELL - Primary potable water source, secondary water source

APPENDIX IV (Cont'd) SOURCE OF WATER SUPPLY. NUMBER OF OCCUPANTS. WATER TREATMENT SYSTEM AND AGE OF PUMP.

| RESIDENCE | WATER SUPPLY | NUMBER OF OCCUPANTS | PRIVATE TREATMENT SYSTEM (Y/N) | AGE OF PUMP (YEARS) |
|---|---|---|---|---|
| 1-36 | N/A | N/A | N/A | N/A |
| 1-37 | SHOREWELLS | 225 | Y | >15 |
| 1-38 | SHOREWELL | 12 | Y | 3 |
| 1-39 | SHOREWELL | 4 | Y | 3 |
| 1-40 | WATERLINE | 2 | Y | >15 |
| 1-41 | SHOREWELL | 2 | Y | UNKNOWN |
| 1-42 | N/A | N/A | N/A | N/A |
| 1-43 | SHOREWELL | 1 | Y | 6 |
| 1-44 | SHOREWELL | 3 | Y | 1 |
| 1-45 | N/A | N/A | N/A | N/A |
| 1-46 | SHOREWELL | 2 | Y | >15 |
| 1-47 | SHOREWELL | 2 | Y | 3 |
| 1-48 | N/A | N/A | N/A | N/A |
| 1-49 | CISTERN,WELL | 4 | N | 5 |
| 1-50 | SHOREWELL | 2 | Y | >15 |
| 1-51 | SHOREWELL | 4 | Y | <15 |
| 1-52 | SHOREWELL | 2 | Y | <15 |
| 1-53 | CISTERN | 2 | N | N/A |
| 1-54 | WATERLINE | 3 (1) | Y | >15 |
| 1-55 | CISTERN |  | N | N/A |
| 1-56 | N/A | N/A | N/A | N/A |
| 1-57 | N/A | N/A | N/A | N/A |
| 1-58 | WATERLINE | 2 | Y | N/A |
| 1-59 | WATERLINE | 2 (?) | Y | 1 |
| 1-60 | N/A | N/A | N/A | N/A |
| 1-61 | N/A | N/A | N/A | N/A |
| 1-62 | SHOREWELL | 4 | Y | >15 |
| 1-63 | WATERLINE | 2 | N | <15 |
| 1-64 | WATERLINE | 2 | N | >15 |
| 1-65 | CISTERN | 5 | N | N/A |
| 1-66 | SHOREWELL | 1 | Y | <15 |
| 1-67 | SHOREWELL | 3 | Y | <15 |
| 1-68 | SHOREWELL | 2 | Y | <15 |
| 1-69 | SHOREWELL | 2 | Y | >15 |
| 1-70 | SHOREWELL | 2 (1) | N | 5 |
| 1-71 | SHOREWELL | 1 | N | <15 |
| 1-72 | WATERLINE | 2 | N | >15 |
| 1-73 | SHOREWELL | 4 | Y | <15 |
| 1-74 | N/A | N/A | N/A | N/A |
| 1-75 | WATERLINE | N/A | N/A | N/A |
| 1-76 | SHOREWELL | N/A | N/A | N/A |
| 1-77 | SHOREWELL | 1 | Y | <15 |
| 1-78 | WELL,CISTERN | 2 | Y | 15 |
| 1-79 | DEEP WELL | 4 | N/A | N/A |
| 1-80 | SHOREWELL | 2 | N | <15 |

N/A - data not available
SHOREWELL* - shorewell observed, data not available
2(4) - two permanent occupants with two additional seasonal occupants
CISTERN, WELL - Primary potable water source, secondary water source

## APPENDIX IV (Cont'd) SOURCE OF WATER SUPPLY, NUMBER OF OCCUPANTS, WATER TREATMENT SYSTEM AND AGE OF PUMP.

| RESIDENCE | WATER SUPPLY | NUMBER OF OCCUPANTS | TREATMENT SYSTEM (Y/N) | AGE OF PUMP (YEARS) |
|---|---|---|---|---|
| 1-81 | SHOREWELL | 2 | Y | UNKNOWN |
| 1-82 | N/A | N/A | N/A | N/A |
| 1-83 | SHOREWELL | 1 | N | <15 |
| 1-84 | SHOREWELL | 2 | N | >15 |
| 1-85 | N/A | N/A | N/A | N/A |
| 1-86 | SHOREWELL | 2 | N | <15 |
| 1-87 | SHOREWELL* | N/A | N/A | N/A |
| 1-88 | SHOREWELL | 2 | Y | >15 |
| 1-89 | N/A | N/A | N/A | N/A |
| 1-90 | SHOREWELL | 3 | Y | <15 |
| 1-91 | SHOREWELL | 3 | Y | <15 |
| 1-92 | SHOREWELL | 2 | N | >15 |
| 1-93 | SHOREWELL | 1 (3) | Y | N/A |
| 1-94 | SHOREWELL | N/A | N/A | N/A |
| 1-95 | SHOREWELL | 5 | Y | 20 |
| 1-96 | SHOREWELL | 2 | Y | 7 |
| 1-97 | SHOREWELL | 3 | Y | <15 |
| 1-98 | SHOREWELL | 2 | N/A | <15 |
| 1-99 | SHOREWELL | 1 | Y | >15 |
| 1-100 | SHOREWELL | 2 | Y | >15 |
| 1-101 | SHOREWELL* | N/A | N/A | N/A |
| 1-102 | SHOREWELL | 4 | N | <15 |
| 1-103 | MUNICIPAL | N/A | N | |
| 1-104 | MUNICIPAL, WELL | 4 | N | N/A |
| 1-105 | MUNICIPAL | N/A | N | |
| 1-106 | MUNICIPAL | N/A | N | |
| 1-107 | MUNICIPAL | N/A | N | |
| 1-108 | MUNICIPAL | N/A | N | |
| 1-109 | MUNICIPAL | N/A | N | |
| 1-110 | WATERLINE, MUN | 4 (3) | N | >15 |
| 1-111 | SHOREWELL | 2 (?) | Y | >15 |
| 1-112 | SHOREWELL | 2 | Y | <15 |
| 1-113 | SHOREWELL | 2 | Y | <15 |
| 1-114 | SHOREWELL | 4 | N | <15 |
| 1-115 | SHOREWELL | 2 | N | UNKNOWN |
| 1-116 | SHOREWELL | 4 | Y | <15 |
| 1-117 | SHOREWELL | 2 | Y | <15 |
| 1-118 | SHOREWELL | 3 | Y | UNKNOWN |
| 1-119 | SHOREWELL* | N/A | N/A | N/A |
| 1-120 | SHOREWELL | 4 | Y | <15 |
| 1-121 | SHOREWELL | 2 | Y | 4 |
| 1-122 | WATERLINE | 4 | N | N/A |
| 1-123 | SHOREWELL | 1 | Y | <15 |
| 1-124 | SHOREWELL | 4 | Y | 2 |
| 1-256 | SHOREWELL | 5 | Y | <15 |

N/A - data not available
SHOREWELL* - shorewell observed, data not available
2(4) - two permanent occupants with two additional seasonal occupants
CISTERN, WELL - Primary potable water source, secondary water source

APPENDIX IV (Cont'd) SOURCE OF WATER SUPPLY. NUMBER OF OCCUPANTS. WATER TREATMENT SYSTEM AND AGE OF PUMP.

| RESIDENCE | WATER SUPPLY | NUMBER OF OCCUPANTS | TREATMENT SYSTEM (Y/N) | AGE OF PUMP (YEARS) |
|---|---|---|---|---|
| 1-125 | CISTERN, WELL | N/A | N/A | N/A |
| 1-126 | SHOREWELL | 3 | Y | 4 |
| 1-127 | SHOREWELL | 3 (1) | Y | >15 |
| 1-128 | SHOREWELL | 2 | Y | <15 |
| 1-129 | SHOREWELL* | N/A | N/A | N/A |
| 1-130 | SHOREWELL | 4 | Y | >15 |
| 1-131 | SHOREWELL | 2 | N | <15 |
| 1-132 | SHOREWELL | 5 | Y | 1 |
| 1-133 | SHOREWELL | 4 | Y | >15 |
| 1-134 | SHOREWELL | 2 | Y | <15 |
| 1-135 | SHOREWELL | (?) | Y | <15 |
| 1-257 | SHOREWELL | 4 | Y | <15 |
| 1-136 | SHOREWELL | 3 | Y | <15 |
| 1-137 | SHOREWELL | 2 | Y | <15 |
| 1-138 | SHOREWELL | 6 | Y | 1 |
| 1-139 | SHOREWELL* | N/A | N/A | N/A |
| 1-140 | SHOREWELL | 3 | Y | >15 |
| 1-141 | SHOREWELL | N/A | N/A | N/A |
| 1-142 | SHOREWELL | N/A | N/A | N/A |
| 1-143 | SHOREWELL* | N/A | N/A | N/A |
| 1-144 | SHOREWELL | 1 | Y | <15 |
| 1-145 | SHOREWELL | 7 | N | 1 |
| 1-258 | SHOREWELL | N/A | Y | 1 |
| 1-146 | SHOREWELL* | N/A | N/A | N/A |
| 1-147 | SHOREWELL | 4 | Y | <15 |
| 1-148 | SHOREWELL | 4 | N | <15 |
| 1-149 | SHOREWELL | 7 (?) | Y | 2 |
| 1-150 | SHOREWELL | 4 | Y | 3 |
| 1-151 | SHOREWELL | 2 | Y | >15 |
| 1-152 | N/A | N/A | N/A | N/A |
| 1-153 | SHOREWELL | 2 | Y | 5 |
| 1-154 | SHOREWELL | 4 | Y | >15 |
| 1-155 | SHOREWELL | 2 | Y | 7 |
| 1-156 | SHOREWELL | 2 | Y | <15 |
| 1-157 | N/A | N/A | N/A | N/A |
| 1-158 | SHOREWELL | 4 | Y | <15 |
| 1-159 | SHOREWELL | 5 | Y | <15 |
| 1-160 | SHOREWELL | 4 | Y | <15 |
| 1-161 | N/A | N/A | N/A | N/A |
| 1-162 | SHOREWELL | 2 (?) | Y | 4 |
| 1-163 | SHOREWELL | 2 | N | UNKNOWN |
| 1-164 | SHOREWELL | 2 | N | >15 |
| 1-165 | SHOREWELL | 2 | Y | >15 |
| 1-166 | SHOREWELL | 2 | N | >15 |
| 1-167 | SHOREWELL | 3 | Y | <15 |

N/A - data not available
SHOREWELL* - shorewell observed, data not available
2(4) - two permanent occupants with two additional seasonal occupants
CISTERN, WELL - Primary potable water source, secondary water source

APPENDIX IV (Cont'd) SOURCE OF WATER SUPPLY, NUMBER OF OCCUPANTS, WATER TREATMENT SYSTEM AND AGE OF PUMP.

| RESIDENCE | WATER SUPPLY | NUMBER OF OCCUPANTS | TREATMENT SYSTEM (Y/N) | AGE OF PUMP (YEARS) |
|---|---|---|---|---|
| 1-168 | SHOREWELL | 2 | Y | >15 |
| 1-169 | N/A | N/A | N/A | N/A |
| 1-170 | SHOREWELL | 2 | Y | >15 |
| 1-171 | SHOREWELL | 0 | N | <15 |
| 1-172 | SHOREWELL | 3 | Y | >15 |
| 1-173 | SHOREWELL | 3 | Y | <15 |
| 1-174 | SHOREWELL | 2 | Y | <15 |
| 1-175 | WATERLINE | 2 | Y | 1 |
| 1-176 | SHOREWELL | 2 (6) | Y | >15 |
| 1-177 | SHOREWELL* | N/A | N/A | N/A |
| 1-178 | SHOREWELL | 1 | N | <15 |
| 1-179 | SHOREWELL* | N/A | N/A | |
| 1-180 | SHOREWELL | 2 | Y | 1 |
| 1-181 | SHOREWELL | 2 | Y | UNKNOWN |
| 1-182 | SHOREWELL | 3 | Y | >15 |
| 1-183 | SHOREWELL | 2 | Y | >15 |
| 1-184 | SHOREWELL | 0 | N | N/A |
| 1-185 | SHOREWELL | 2 | Y | <15 |
| 1-186 | SHOREWELL | 4 | Y | <15 |
| 1-187 | WELL & CISTERN | 3 | N | <15 |
| 1-188 | CISTERN | 1 | N | N/A |
| 1-189 | SHOREWELL | 1 (1) | Y | UNKNOWN |
| 1-190 | SHOREWELL | 2 | Y | >15 |
| 1-191 | SHOREWELL | 4 | Y | 34 |
| 1-192 | SHOREWELL | 3 | Y | 4 |
| 1-193 | SHOREWELL | 3 (2) | Y | <15 |
| 1-194 | SHOREWELL* | N/A | N/A | N/A |
| 1-195 | SHOREWELL | 3 | N | <15 |
| 1-196 | SHOREWELL | 2 | Y | >15 |
| 1-197 | SHOREWELL | 4 | Y | <15 |
| 1-198 | SHOREWELL | 1 | Y | 8 |
| 1-199 | SHOREWELL | 4 | Y | >15 |
| 1-200 | SHOREWELL | 2 | Y | 15 |
| 1-201 | SHOREWELL | 5 | Y | <15 |
| 1-202 | SHOREWELL | 4 | Y | <15 |
| 1-203 | SHOREWELL | 2 | Y | <15 |
| 1-204 | SHOREWELL | 4 | Y | 1 |
| 1-205 | SHOREWELL | 2 | Y | >15 |
| 1-206 | SHOREWELL | 1 | Y | <15 |
| 1-207 | SHOREWELL | 1 | Y | 15 |
| 1-208 | SHOREWELL | 4 | Y | <15 |
| 1-209 | N/A | N/A | N/A | N/A |
| 1-210 | SHOREWELL | 2 | Y | UNKNOWN |
| 1-211 | SHOREWELL | 2 | Y | <15 |
| 2-9 | SHOREWELL | 4 | Y | UNKNOWN |
| 2-10 | SHOREWELL | N/A | N | >15 |

N/A - data not available
SHOREWELL* - shorewell observed, data not available
2(4) - two permanent occupants with two additional seasonal occupants
CISTERN, WELL - Primary potable water source, secondary water source

# APPENDIX V

## LIST OF SHARED SHOREWELLS

APPENDIX V NIAGARA RIVER SHOREWELLS: SHARED WELLS.

| RESIDENCE I.D. | SHOREWELL SHARED WITH: |
|---|---|
| 1-9 | 1-303 |
| 1-13 | 1-251, 1-252, 1-14, 1-15, 1-16, 1-17, 1-18, 1-19, 1-20, 1-21, 1-253, 1-22 1-23, 1-254, 1-24, 1-25 1-26, 1-27 |
| 1-255 | 1-28 |
| 1-91 | 1-92 |
| 1-93 | 1-94 |
| 1-125 | 1-126 |
| 1-130 | 1-131 |
| 1-132 | 1-133 |
| 1-134 | 1-135 |
| 1-145 | 1-258 |

# APPENDIX VI

## BACTERIOLOGICAL ANALYTICAL RESULTS

APPENDIX VI BACTERIOLOGICAL ANALTYICAL RESULTS. ALL VALUES IN organisms/100 mL.

| | REGIONAL NIAGARA HEALTH UNIT DRINKING WATER GUIDELINES | |
|---|---|---|
| | TOTAL COLIFORM | FECAL COLIFORM |
| | 2 | 0 |

| SAMPLE # | TOTAL COLIFORM | FECAL COLIFORM | RAW/TREATED (R/T) | SHOREWELL USED FOR POTABLE WATER SOURCE (Y/N) |
|---|---|---|---|---|
| 1-2 | **10** | **2** | T | Y |
| 1-7 | **>80** | **28** | T | Y |
| 1-301 | **33** | **18** | R | N |
| 1-303 | 0 | 0 | T | Y |
| 1-10[a] | **>80** | **32** | R | N |
| 1-12 | **>80** | **24** | T | Y |
| 1-14 | **9** | **2** | T | N |
| 1-20 | **>80** | **40** | T | N |
| 1-22 | **7** | **2** | T | N |
| 1-22 DUP | **8** | **2** | T | N |
| 1-25 | 0 | 0 | R | Y |
| 1-255 | 0 | 0 | R | Y |
| 1-31A | **>80** | **47** | R | N |
| 1-31B | **12** | 0 | T | Y |
| 1-32 | **18** | **1** | T | N |
| 1-37A | **9** | **2** | R | N |
| 1-37B | 0 | 0 | T | Y |
| 1-38 | 0 | 0 | T | Y |
| 1-40 | 0 | 0 | T | N |
| 1-40 DUP | 0 | 0 | T | N |
| 1-44 | 0 | 0 | T | Y |
| 1-46 | 0 | 0 | T | Y |
| 1-51 | 0 | 0 | T | Y |
| 1-52 | 0 | 0 | T | N |
| 1-54 | **39** | **5** | T | N |
| 1-58 | 0 | 0 | T | Y |
| 1-63 | **42** | **13** | R | N |
| 1-66 | 0 | 0 | T | Y |
| 1-67A | **9** | 0 | R | N |
| 1-67B | 2 | 0 | T | Y |
| 1-72 | **36** | **6** | R | N |
| 1-77 | **3** | **1** | T | Y |
| 1-80 | **6** | 0 | R | N |
| 1-83 | **5** | 0 | R | N |
| 1-88 | 0 | 0 | T | Y |

**BOLD** value exceeds Regional Niagara Health Unit guideline for drinking water
a - sample obtained prior to treatment system (distillery used for potable water)
DUP - duplicate sample

APPENDIX VI (Cont'd) BACTERIOLOGICAL ANALTYICAL RESULTS. ALL VALUES IN organisms/100 mL.

| | REGIONAL NIAGARA HEALTH UNIT DRINKING WATER GUIDELINES | | | |
|---|---|---|---|---|
| | TOTAL COLIFORM | FECAL COLIFORM | | |
| | 2 | 0 | | |
| SAMPLE # | TOTAL COLIFORM | FECAL COLIFORM | RAW/TREATED (R/T) | SHOREWELL USED FOR POTABLE WATER SOURCE (Y/N) |
| 1-90 | 0 | 0 | T | Y |
| 1-95 | 0 | 0 | T | Y |
| 1-97A[a] | **17** | **2** | R | N |
| 1-97B | 0 | 0 | T | N |
| 1-100A | **44** | **17** | R | N |
| 1-100B | 0 | 0 | T | Y |
| 1-100B DUP | 0 | 0 | T | Y |
| 1-102 | **9** | **1** | R | N |
| 1-111 | **6** | 0 | T | Y |
| 1-113A[b] | **>80** | **5** | R | N |
| 1-113B | 0 | 0 | T | Y |
| 1-114 | **>80** | **18** | R | N |
| 1-116 | 0 | 0 | T | Y |
| 1-117 | 0 | 0 | T | Y |
| 1-123 | **16** | 0 | T | N |
| 1-256 | 0 | 0 | T | Y |
| 1-126[a] | **26** | **7** | T | N |
| 1-126[a] DUP | **16** | **8** | T | N |
| 1-130 | 0 | 0 | T | Y |
| 1-133A | **12** | **1** | R | N |
| 1-133B | **3** | **1** | T | N |
| 1-133B DUP | **7** | **2** | T | N |
| 1-257 | 0 | 0 | T | Y |
| 1-136A | **>80** | **27** | R | N |
| 1-136B | 0 | 0 | T | Y |
| 1-138A | **5** | **1** | R | N |
| 1-138B | 2 | 0 | T | N |
| 1-140 | 2 | 0 | T | N |
| 1-144 | **25** | **8** | T | N |
| 1-147 | **6** | 0 | T | Y |
| 1-147 DUP | **6** | **1** | T | Y |
| 1-151 | **9** | **5** | T | N |
| 1-155 | 0 | 0 | T | Y |

BOLD value exceeds Regional Niagara Health Unit guideline for drinking water  
a - sample obtained after treatment system, but not from distillery (Dist. used for potable water)  
b - Niagara River grab sample  
DUP - duplicate sample

APPENDIX VI (Cont'd) BACTERIOLOGICAL ANALTYICAL RESULTS. ALL VALUES IN organisms/100 mL.

| | REGIONAL NIAGARA HEALTH UNIT DRINKING WATER GUIDELINES | | | |
|---|---|---|---|---|
| | TOTAL COLIFORM | FECAL COLIFORM | | |
| | 2 | 0 | | |
| SAMPLE # | TOTAL COLIFORM | FECAL COLIFORM | RAW/TREATED (R/T) | SHOREWELL USED FOR POTABLE WATER SOURCE (Y/N) |
| 1-158 | 0 | 0 | T | Y |
| 1-162 | 0 | 0 | T | Y |
| 1-164 | 0 | 0 | R | N |
| 1-166 | **9** | **1** | R | N |
| 1-170 | 0 | 0 | T | Y |
| 1-170 DUP | 0 | 0 | T | Y |
| 1-174 | 0 | 0 | T | N |
| 1-178 | **3** | 0 | R | N |
| 1-181A[a] | 0 | 0 | R | N |
| 1-181B | 0 | 0 | T | Y |
| 1-182 | 0 | 0 | T | Y |
| 1-186 | **5** | **1** | T | Y |
| 1-190 | 0 | 0 | T | Y |
| 1-192 | 0 | 0 | T | Y |
| 1-193 | 0 | 0 | T | Y |
| 1-196 | 0 | 0 | T | Y |
| 1-199 | 1 | 0 | T | N |
| 1-202A | **15** | **4** | R | N |
| 1-202B | 0 | 0 | T | Y |
| 1-203A[b] | **5** | **2** | R | N |
| 1-203B | 0 | 0 | T | N |
| 1-204A | **>80** | **5** | R | N |
| 1-204B | **10** | **7** | T | N |
| 1-206 | 0 | 0 | T | Y |
| 1-211 | **3** | 0 | T | N |
| 2-9 | 0 | 0 | T | Y |
| 2-10[c] | **27** | **2** | R | N |

**BOLD** value exceeds Regional Niagara Health Unit guideline for drinking water
a - raw water source not available, obtained sample after (unplugged) chlorinator
b - grab sample from shorewell
c - grab sample from Chippawa Creek
DUP - duplicate sample

# APPENDIX VII

## METAL AND GENERAL CHEMISTRY ANALYTICAL RESULTS

# APPENDIX VII

| CONSTITUENT | MDL* |
|---|---|
| COPPER | 0.0005 |
| NICKEL | 0.002 |
| LEAD | 0.005 |
| ZINC | 0.0005 |
| IRON | 0.02 |
| MANGANESE | 0.0005 |
| ARSENIC | 0.001 |
| CADMIUM | 0.0002 |
| CHROMIUM | 0.0005 |
| MERCURY | 0.02** |
| SELENIUM | 0.001 |
| CONDUCTIVITY (@ 25°C) | |
| HARDNESS ($CaCO_3$) | 0.2 |
| CALCIUM | 0.05 |
| MAGNESIUM | 0.02 |
| SODIUM | 0.02 |
| POTASSIUM | 0.01 |
| ALKALINITY | |
| pH | |
| CHLORIDE | 0.2 |
| SULPHATE | 0.5 |
| NITROGEN (TOTAL KJELDAHL) | 0.02 |
| AMMONIUM NITROGEN | 0.002 |
| NITRATES | 0.005 |
| NITRITES | 0.001 |

*** MINIMUM DETECTION LIMITS IN mg/L (ppm)**
**** MINIMUM DETECTION LIMITS IN μg/L (ppb)**

APPENDIX VII GENERAL CHEMICAL ANALYTICAL DATA COMPARED TO ONTARIO DRINKING WATER OBJECTIVES (ODWO). RESULTS IN mg/L (ppm).

| CONSTITUENT | ODWO GUIDELINES | MOEE MDL* | SAMPLE 1-100A | 1-100B | 1-202A | 1-202B | 1-133A | 1-133B | 1-138A | 1-138B | 1-67A | 1-67B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COPPER | 1.0 | 0.0005 | 0.0033 | 0.018 | 0.056 | 0.16 | 0.01 | 0.035 | 0.022 | 0.01 | 0.037 | 0.0029 |
| NICKEL |  | 0.002 | <0.002 | <0.002 | <0.002 | 0.005 | <0.002 | 0.004 | <0.002 | <0.002 | 0.005 | <0.002 |
| LEAD | 0.01 | 0.005 | <0.005 | <0.005 | 0.006 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | **0.02** | <0.005 |
| ZINC | 5.0 | 0.0005 | 0.023 | 0.046 | 0.16 | 0.0082 | 0.032 | 0.043 | 0.3 | 0.018 | 1.8 | 0.084 |
| IRON | 0.3 | 0.02 | 0.12 | <0.02 | 0.24 | 0.056 | 0.091 | 0.075 | 0.19 | <0.02 | **1.5** | <0.02 |
| MANGANESE | 0.05 | 0.0005 | 0.033 | 0.0016 | 0.026 | 0.0022 | 0.024 | 0.03 | 0.025 | 0.0008 | 0.0047 | <0.0005 |
| ARSENIC | 0.05 | 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| CADMIUM | 0.005 | 0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0003 | <0.0002 | 0.0012 | <0.0002 |
| CHROMIUM | 0.05 | 0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0008 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| MERCURY ** | 1.0 | 0.02 | NA | NA | NA | NA | NA | NA | NA | NA | <0.02 | <0.02 |
| SELENIUM | 0.01 | 0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| CONDUCTIVITY (@ 25 °C) |  |  | 1137 | 290 | 723 | 769 | 549 | 557 | 591 | 653 | 2260 | 242 |
| HARDNESS ($CaCO_3$) | 80-100 | 0.2 | 321 | 27.1 | 237 | 0.95 | 195 | 206 | 227 | 3.65 | 633 | 14.9 |
| CALCIUM |  | 0.05 | 69 | 6.3 | 62.5 | 0.2 | 52.7 | 56.3 | 60.8 | 0.75 | 169 | 4.15 |
| MAGNESIUM |  | 0.02 | 36.1 | 2.77 | 19.7 | 0.1 | 15.3 | 16 | 18.2 | 0.42 | 51.2 | 1.09 |
| SODIUM | 200 | 0.02 | 109 | 44.1 | 52.3 | 163 | 34 | 35.3 | 37.8 | 142 | **234** | 41.4 |
| POTASSIUM |  | 0.01 | 1.318 | 0.402 | 1.414 | 0.206 | 1.27 | 1.272 | 1.174 | 0.22 | 1.583 | 0.316 |
| ALKALINITY | 30-500 |  | 158 | **26** | 171.5 | 174.2 | 143.2 | 144.5 | 153.1 | 158.4 | 351.1 | **24.3** |
| pH | 6.5-8.5 |  | 8.02 | 7.04 | 7.96 | 7.86 | 8.01 | 7.94 | 8.02 | 7.96 | 7.79 | 6.71 |
| CHLORIDE | 250 | 0.2 | 206 | 70.1 | 115 | 118 | 62.8 | 64.2 | 73.8 | 81.6 | **527** | 57.7 |
| SULPHATE | 500 | 0.5 | 109.8 | 3.19 | 28.33 | 28.99 | 45.12 | 45.86 | 41.5 | 43.24 | 83.32 | 0.97 |
| NITROGEN (TOTAL KJELDAHL) |  | 0.02 | 0.16 | <0.02 | 0.2 | 0.11 | 0.15 | 0.15 | 0.18 | 0.15 | 0.26 | 0.03 |
| AMMONIUM NITROGEN |  | 0.002 | 0.002 | 0.018 | 0.002 | <0.002 | 0.004 | 0.004 | 0.006 | 0.004 | <0.002 | 0.008 |
| NITRATES | 10 | 0.005 | 0.195 | 0.07 | 0.32 | 0.31 | 0.1 | 0.1 | 0.12 | 0.14 | 0.12 | 0.03 |
| NITRITES | 1 | 0.001 | 0.003 | 0.003 | 0.004 | 0.002 | 0.004 | 0.004 | 0.004 | 0.003 | 0.004 | 0.007 |
| ION BALANCE CALCLC. |  |  | 0.7157 | 3.888 | 3.308 | 4.528 | 3.333 | 0.5852 | 3.186 | 1.973 | 3.321 | 1.378 |
| TOTAL POS. IONS |  |  | 11.19 | 2.472 | 7.051 | 7.114 | 5.4 | 5.694 | 6.206 | 6.255 | 22.87 | 2.106 |
| TOTAL NEG. IONS |  |  | 11.27 | 2.568 | 7.28 | 7.436 | 5.58 | 5.661 | 6.015 | 6.378 | 23.62 | 2.135 |
| EST. DISS. SOLIDS |  |  | 628.4 | 143 | 385.2 | 418.1 | 299 | 307.5 | 327.2 | 365.4 | 1281 | 120.6 |
| EST. CONDUCTIVITITY |  |  | 1266 | 293.3 | 783.3 | 743.3 | 602.8 | 622.8 | 667.7 | 646.2 | 2488 | 244.2 |

* Ministry of Environment and Energy minimum detection limits
** results and guidelines in µg/L (parts per billion)
**Bold** - exceeds ODWO criterion

APPENDIX VII (Cont'd) GENERAL CHEMICAL ANALYTICAL DATA COMPARED TO ONTARIO DRINKING WATER OBJECTIVES. RESULTS IN mg/L (ppm).

| CONSTITUENT | ODWO GUIDELINES | SAMPLE 1-117A | 1-117B | 1-193A | 1-193B | 1-303A | 1-303B | 1-303A (dup) | 1-303B (dup) | 1-88A | 1-88B | 1-158A | 1-158B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COPPER | 1.0 | 0.26 | 0.048 | 0.092 | 0.018 | 0.041 | 0.12 | 0.04 | 0.14 | 0.0032 | 0.095 | 0.038 | 0.053 |
| NICKEL |  | <0.002 | <0.002 | 0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| LEAD | 0.01 | <0.005 | <0.005 | 0.009 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| ZINC | 5.0 | 0.17 | 0.01 | 0.45 | 0.16 | 0.17 | 0.16 | 0.17 | 0.17 | 0.2 | 0.024 | 0.012 | 0.0033 |
| IRON | 0.3 | 0.063 | 0.039 | **2.7** | <0.02 | 0.073 | <0.02 | 0.069 | <0.02 | 0.1 | 0.14 | 0.12 | 0.084 |
| MANGANESE | 0.05 | 0.011 | 0.0009 | **0.069** | <0.0005 | 0.0027 | 0.0011 | 0.0027 | 0.001 | 0.015 | 0.016 | 0.016 | 0.0045 |
| ARSENIC | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| CADMIUM | 0.005 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0003 | <0.0002 | <0.0002 | 0.0007 | 0.0004 | <0.0002 | <0.0002 |
| CHROMIUM | 0.05 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0006 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 |
| MERCURY* | 1.0 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | NA | <0.02 | NA | NA |
| SELENIUM | 0.01 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| CONDUCTIVITY (@ 25 °C) |  | 699 | 789 | 299 | 362 | 348 | 348 | 346 | 345 | 452 | 543 | 323 | 358 |
| HARDNESS ($CaCO_3$) | 80-100 | 282 | 0.25 | 123 | 123 | 138 | 142 | 140 | 143 | 172 | <0.2 | 135 | <0.2 |
| CALCIUM |  | 67.2 | 0.1 | 34.5 | 35.4 | 38.5 | 40.1 | 40.2 | 40.1 | 43 | <0.05 | 38 | <0.05 |
| MAGNESIUM |  | 27.7 | 0.04 | 8.93 | 8.33 | 10.2 | 10.2 | 9.73 | 10.3 | 15.7 | <0.02 | 9.73 | 0.04 |
| SODIUM | 200 | 26.3 | 186 | 9.36 | 21.2 | 13.7 | 13.7 | 13.6 | 13.5 | 22.9 | 121 | 12.2 | 75.9 |
| POTASSIUM |  | 1.39 | 0.135 | 1.515 | 1.45 | 1.57 | 1.48 | 1.55 | 1.435 | 1.667 | 0.119 | 1.575 | 0.319 |
| ALKALINITY | 30-500 | 144.9 | 151.1 | 98.1 | 93.4 | 109.1 | 109 | 108.5 | 107.8 | 120.7 | 122.2 | 103 | 104.9 |
| pH | 6.5-8.5 | 7.86 | 7.94 | 8.04 | 7.78 | 8.04 | 8.08 | 8.0 | 8.06 | 7.93 | 8.43 | 8.34 | 8.41 |
| CHLORIDE | 250 | 68.8 | 70.7 | 18.2 | 33.8 | 26.3 | 25.7 | 25.7 | 25.4 | 38.9 | 56.6 | 22.3 | 28.6 |
| SULPHATE | 500 | 120.7 | 115.31 | 25.95 | 34.66 | 28.76 | 29.11 | 30.04 | 29.36 | 52.63 | 54.66 | 27.38 | 27.35 |
| NITROGEN (TOTAL KJELDAHL) |  | 0.18 | 0.17 | 0.25 | 0.11 | 0.2 | 0.17 | 0.21 | 0.18 | 0.22 | 0.17 | 0.24 | 0.19 |
| AMMONIUM NITROGEN |  | 0.004 | 0.008 | 0.016 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | 0.008 | <0.002 | 0.018 | 0.01 |
| NITRATES | 10 | 0.35 | 0.355 | 0.475 | 0.5 | 0.595 | 0.56 | 0.595 | 0.56 | 0.305 | 0.285 | 0.4 | 0.425 |
| NITRITES | 1 | 0.003 | 0.002 | 0.005 | <0.001 | 0.002 | <0.001 | 0.002 | 0.001 | 0.005 | <0.001 | 0.006 | 0.003 |
| ION BALANCE CALC. |  | 8.255 | 8.902 | 5.011 | 4.881 | 4.937 | 2.192 | 3.608 | 1.453 | 3.364 | 1.286 | 0.5776 | 5.78 |
| TOTAL POS. IONS |  | 6.812 | 8.103 | 2.903 | 3.411 | 3.397 | 3.474 | 3.438 | 3.472 | 4.477 | 5.266 | 3.269 | 3.314 |
| TOTAL NEG. IONS |  | 7.375 | 7.441 | 3.049 | 3.578 | 3.564 | 3.55 | 3.562 | 3.523 | 4.627 | 5.199 | 3.288 | 3.505 |
| EST. DISS. SOLIDS |  | 402 | 466 | 160.4 | 194 | 188.2 | 189.2 | 189.6 | 188.3 | 249.8 | 308.2 | 175.8 | 198.1 |
| EST. CONDUCTIVITITY |  | 808.2 | 807.2 | 322.2 | 388.8 | 378 | 381.3 | 380.8 | 380 | 503.3 | 544.2 | 355.6 | 346.7 |

* results in µg/L (parts per billion)

**Bold** - results exceed ODWO criteria

APPENDIX VII (Cont'd) GENERAL CHEMICAL ANALYTICAL DATA COMPARED TO ONTARIO DRINKING WATER OBJECTIVES. RESULTS IN mg/L (ppm).

| CONSTITUENT | ODWO GUIDELINES | SAMPLE 1-126A | 1-126B | 1-126A (Dup) | 1-126B (Dup) | Trip Blank | 1-151A | 1-151B | 1-52A | 1-52B |
|---|---|---|---|---|---|---|---|---|---|---|
| COPPER | 1.0 | 0.029 | 0.0074 | 0.024 | 0.0067 | <0.0005 | 0.12 | 0.021 | 0.0027 | 0.4 |
| NICKEL | | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | 0.019 |
| LEAD | 0.01 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 |
| ZINC | 5.0 | 0.16 | 0.15 | 0.15 | 0.14 | 0.0008 | 0.25 | 0.013 | 0.022 | 1.3 |
| IRON | 0.3 | 0.17 | 0.15 | 0.17 | 0.15 | <0.02 | 0.12 | 0.033 | **0.46** | <0.2 |
| MANGANESE | 0.05 | 0.012 | 0.012 | 0.012 | 0.012 | <0.0005 | 0.012 | 0.0008 | **0.67** | **0.81** |
| ARSENIC | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| CADMIUM | 0.005 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | 0.0003 |
| CHROMIUM | 0.05 | 0.0006 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0008 | 0.0006 | 0.0019 |
| MERCURY* | 1.0 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 | <0.02 |
| SELENIUM | 0.01 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| CONDUCTIVITY (@ 25 °C) | | 335 | 334 | 335 | 334 | 4 | 502 | 93.8 | 493 | 17 |
| HARDNESS ($CaCO_3$) | 80-100 | 135 | 135 | 135 | 136 | <0.2 | 209 | 28.9 | 238 | 0.55 |
| CALCIUM | | 39 | 39.1 | 39.1 | 39.15 | <0.05 | 46.4 | 4.70 | 72.7 | 0.2 |
| MAGNESIUM | | 9.16 | 9.08 | 9.11 | 9.18 | <0.02 | 22.6 | 4.18 | 13.6 | <0.02 |
| SODIUM | 200 | 13.66 | 13.75 | 13.49 | 13.74 | <0.02 | 23 | 11.51 | 10.5 | 0.03 |
| POTASSIUM | | 1.59 | 1.582 | 1.579 | 1.576 | <0.01 | 1.203 | 0.285 | 1.5 | 0.02 |
| ALKALINITY | 30-500 | 102.2 | 101.9 | 102.1 | 102.0 | **2.1** | 132.8 | **4.9** | 204.0 | **7.7** |
| pH | 6.5-8.5 | 8.32 | 8.30 | 8.34 | 8.34 | **6.23** | 7.81 | **5.82** | 7.63 | **6.46** |
| CHLORIDE | 250 | 28 | 27.5 | 27.4 | 27.7 | <0.2 | 44.4 | 17.2 | 20.90 | <0.2 |
| SULPHATE | 500 | 27.41 | 26.98 | 27.03 | 26.98 | <0.5 | 64.12 | 17.32 | 31.11 | <0.5 |
| NITROGEN (TOTAL KJELDAHL) | | 0.25 | 0.26 | 0.25 | 0.23 | <0.02 | 0.18 | 0.07 | 0.52 | 0.39 |
| AMMONIUM NITROGEN | | 0.024 | 0.022 | 0.018 | 0.022 | 0.006 | 0.008 | 0.05 | 0.262 | 0.322 |
| NITRATES | 10 | 0.435 | 0.42 | 0.42 | 0.42 | <0.005 | 0.335 | 0.05 | 0.21 | 0.02 |
| NITRITES | 1 | 0.008 | 0.006 | 0.005 | 0.006 | 0.001 | 0.002 | 0.003 | 0.012 | 0.006 |
| ION BALANCE CALC. | | 2.979 | 2.013 | 2.367 | 1.938 | 4027.0 | 1.129 | 15.23 | 1.299 | 329.7 |
| TOTAL POS. IONS | | 3.336 | 3.338 | 3.329 | 3.349 | 0.001 | 5.207 | 1.092 | 5.261 | 0.036 |
| TOTAL NEG. IONS | | 3.436 | 3.406 | 3.408 | 3.413 | 0.042 | 5.266 | 0.9473 | 5.329 | 0.1553 |
| EST. DISS. SOLIDS | | 183.1 | 182.0 | 181.9 | 182.4 | 1.289 | 284.2 | 58.47 | 275.9 | 5.46 |
| EST. CONDUCTIVITITY | | 370.4 | 368.5 | 368.1 | 369.5 | 2.102 | 578.5 | 126.1 | 542.5 | 9.414 |

* results in µg/L (parts per billion)
**Bold** - exceeds Ontario Drinking Water Objectives

APPENDIX VII (Cont'd) GENERAL CHEMICAL ANALYTICAL DATA COMPARED TO ONTARIO DRINKING WATER OBJECTIVES. RESULTS IN mg/L (ppm).

| CONSTITUENT | ODWO GUIDELINES | SAMPLE 1-31A | 1-31B | 1-37A | 1-37B | 1-136A | 1-136B | 1-181A | 1-181B | 1-204A | 1-204B | 2-9A | 2-9B | 2-10A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COPPER | 1.0 | 0.095 | 0.12 | 0.099 | 0.028 | 0.026 | 0.012 | 0.0068 | 0.014 | 0.024 | 0.28 | 0.0084 | 0.025 | 0.0035 |
| NICKEL | | <0.002 | <0.002 | <0.002 | <0.002 | 0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 | <0.002 |
| LEAD | 0.01 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | <0.005 | 0.008 | <0.005 | <0.005 | <0.005 | <0.005 |
| ZINC | 5.0 | 0.068 | 0.075 | 0.066 | 0.074 | 0.27 | 0.1 | 0.17 | 0.98 | 0.15 | 0.21 | 0.042 | 0.012 | 0.0072 |
| IRON | 0.3 | 0.14 | 0.043 | **0.57** | 0.11 | **0.33** | <0.02 | 0.059 | 0.023 | 0.071 | 0.046 | 0.17 | 0.14 | 0.13 |
| MANGANESE | 0.05 | 0.032 | 0.0034 | 0.02 | 0.0045 | 0.022 | <0.0005 | 0.018 | 0.0047 | 0.0065 | 0.0023 | 0.0056 | 0.0026 | 0.0039 |
| ARSENIC | 0.05 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| CADMIUM | 0.005 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 | <0.0002 |
| CHROMIUM | 0.05 | <0.0005 | <0.0005 | <0.0005 | <0.0005 | 0.0008 | 0.0007 | 0.0009 | 0.0007 | 0.0006 | 0.0011 | <0.0005 | 0.0007 | 0.0014 |
| MERCURY* | 1.0 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | <0.02 | <0.02 | <0.02 |
| SELENIUM | 0.01 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 | <0.001 |
| CONDUCTIVITY (@ 25 °C) | | 324 | 314 | 297 | 354 | 1261 | 85 | 401 | 398 | 1660 | 1690 | 299 | 309 | 282 |
| HARDNESS (CaCO$_3$) | 80-100 | 144.26 | 140.0 | 113.28 | 127.44 | 398.81 | 3.37 | 155.73 | 151.5 | 620.92 | 375.15 | 132 | 0.5 | 121 |
| CALCIUM | | 39.95 | 38.45 | 30.15 | 35.05 | 82.90 | 0.85 | 44.4 | 43.2 | 113.0 | 78.7 | 36.9 | 0.1 | 34.2 |
| MAGNESIUM | | 10.8 | 10.58 | 9.22 | 9.71 | 46.6 | 0.31 | 10.9 | 10.6 | 62.4 | 43.4 | 9.55 | 0.05 | 8.77 |
| SODIUM | 200 | 9.77 | 9.66 | 15.81 | 18.49 | 113.0 | 15.12 | 20.68 | 20.31 | 155.0 | **233.0** | 8.92 | 70 | 9.12 |
| POTASSIUM | | 1.581 | 1.526 | 3.326 | 1.785 | 2.165 | 0.31 | 1.401 | 1.378 | 1.852 | 1.434 | 1.79 | 0.32 | 1.64 |
| ALKALINITY | 30-500 | 109.8 | 105.7 | 80.9 | 59.4 | 207.5 | **14.4** | 122.4 | 121.5 | 267.0 | 274.9 | 97.5 | 97.8 | 93.1 |
| pH | 6.5-8.5 | 8.23 | 8.24 | 8.09 | 7.48 | 8.02 | 6.85 | 8.21 | 8.16 | 7.97 | 7.95 | 8.06 | 8.04 | 8.10 |
| CHLORIDE | 250 | 17.0 | 16.8 | 27.60 | 30.40 | 217.0 | 16.6 | 35.8 | 35.4 | **281.0** | **278.0** | 17.3 | 17.3 | 17.3 |
| SULPHATE | 500 | 32.3 | 31.16 | 27.36 | 64.43 | 129.25 | 0.58 | 30.94 | 30.56 | 184.14 | 195.05 | 29.51 | 29.86 | 25.19 |
| NITROGEN (TOTAL KJELDAHL) | | 0.21 | 0.16 | 0.61 | 0.19 | 0.45 | 0.20 | 0.09 | 0.1 | 0.29 | 0.25 | 0.23 | 0.21 | 0.37 |
| AMMONIUM NITROGEN | | 0.002 | 0.004 | 0.016 | 0.002 | 0.016 | <0.002 | <0.002 | 0.006 | 0.12 | 0.004 | 0.016 | 0.012 | 0.03 |
| NITRATES | 10 | 0.335 | 0.355 | 0.34 | 0.35 | 0.285 | 0.075 | 0.215 | 0.21 | 0.095 | 0.09 | 0.4 | 0.395 | 0.395 |
| NITRITES | 1 | 0.004 | 0.003 | 0.028 | <0.001 | 0.014 | 0.002 | <0.001 | 0.003 | 0.003 | 0.003 | 0.007 | 0.005 | 0.006 |
| ION BALANCE CALC. | | 0.7143 | 0.4025 | 1.568 | 0.3851 | 0.2827 | 5.423 | 1.702 | 3.345 | 2.694 | 1.536 | 0.5967 | 0.987 | 1.157 |
| TOTAL POS. IONS | | 3.348 | 3.249 | 3.037 | 3.398 | 12.94 | 0.7337 | 4.048 | 3.947 | 17.56 | 17.67 | 3.062 | 3.063 | 2.869 |
| TOTAL NEG. IONS | | 3.372 | 3.262 | 2.99 | 3.411 | 12.98 | 0.7735 | 4.117 | 4.079 | 17.10 | 17.4 | 3.08 | 3.093 | 2.902 |
| EST. DISS. SOLIDS | | 179.8 | 174.2 | 164.3 | 197.6 | 718.7 | 42.88 | 219.7 | 216.5 | 960.6 | 997.6 | 165.2 | 179 | 154.8 |
| EST. CONDUCTIVITITY | | 362.1 | 351.4 | 335.3 | 400.3 | 1441 | 85.09 | 442.7 | 435.3 | 1902 | 1893 | 333.9 | 310.2 | 313.0 |

* results in µg/L (parts per billion)

**Bold** - exceeds ODWO criteria

# APPENDIX VIII

## ORGANIC AND PESTICIDE PARAMETER ANALYTICAL RESULTS

## APPENDIX VIII

| CONSTITUENT | MDL* |
|---|---|
| 2,4,6-TRICHLOROPHENOL | 20 |
| 2,4,5-TRICHLOROPHENOL | 100 |
| 2,3,4-TRICHLOROPHENOL | 100 |
| 2,3,5,6-TETRACHLOROPHENOL | 10 |
| 2,3,4,5-TETRACHLOROPHENOL | 20 |
| PENTACHLOROPHENOL | 10 |
| DICAMBA | 50 |
| 2,4,D-PROPIONIC ACID | 100 |
| 2,4-DICHLOROPHENOXYACETIC | 100 |
| SILVEX | 20 |
| 2,4,5-TRICHLOROPHENOXYACETIC | 50 |
| 2,4-DICHLOROPHENOXYBUTYRC | 200 |
| PICLORAM | NA |
| AMETRYNE | 50 |
| PROMETONE | 50 |
| PROPAZINE | 50 |
| ATRAZINE | 50 |
| PROMETRYNE | 50 |
| SIMAZINE | 50 |
| SENCOR | 100 |
| BLADEX | 100 |
| ATRATONE | 50 |
| DETHYLATED ATRAZINE | 200 |
| METOLACHLOR | 500 |
| LASSO | 500 |
| DIETHYL SIMAZINE | 200 |
| HEXACHLOROETHANE | 1 |
| 1,3,5-TRICHLOROBENZENE | 5 |
| 1,2,4-TRICHLOROBENZENE | 5 |
| HEXACHLOROBUTADIENE | 1 |
| 1,2,3-TRICHLOROBENZENE | 5 |
| 2,4,5-TRICHLOROTOLUENE | 5 |
| 2,3,6-TRICHLOROTOLUENE | 5 |
| 1,2,3,5-TETRACHLOROBENZENE | 1 |
| 1,2,4,5-TETRACHLOROBENZENE | 1 |
| 2,6,a-TRICHLOROTOLUENE | 5 |
| 1,2,3,4-TETRACHLOROBENZENE | 1 |
| PENTACHLOROBENZENE | 1 |
| PCB (total) | 20 |

*** MINIMUM DETECTION LIMITS IN ng/L (ppt)**

# APPENDIX VIII

| CONSTITUENT | MDL* |
|---|---|
| HEXACHLOROBENZENE | 1 |
| HEPTACHLOR | 1 |
| ALDRIN | 1 |
| PP-DDE | 1 |
| MIREX | 5 |
| A-BHC HEXACHLOROCYCLOHEXANE | 1 |
| B-BHC HEXACHLOROCYCLOHEXANE | 1 |
| G-BHC HEXACHLOROCYCLOHEXANE | 1 |
| A-CHLORDANE | 2 |
| G-CHLORDANE | 2 |
| OXYCHLORDANE | 2 |
| OP-DDT | 5 |
| PP-DDD | 5 |
| PP-DDT | 5 |
| DMDT METHOXYCHLOR | 5 |
| HEPTACHLOREPOXIDE | 1 |
| ENDOSULFAN I | 2 |
| DIELDRIN | 2 |
| ENDRIN | 5 |
| ENDOSULFAN II | 5 |
| ENDOSULFAN SULPHATE | 5 |
| OCTOCHLOROSTYRENE | 1 |
| TOXAPHENE | 500 |
| DIAZINON | 20 |
| DICHLOROVOS | 20 |
| DURSBAN | 20 |
| ETHION | 20 |
| GUTHION | NA |
| MALATHION | 20 |
| MEVINPHOS | 20 |
| METHYPARATHION | 50 |
| METHYLTRITHION | 20 |
| PARATHION | 20 |
| PHORATE (THIMET) | 20 |
| RELDAN | 20 |
| RONNEL | 20 |
| AMINOCARB | NA |
| BENOMYL | NA |
| BUX | NA |

*** MINIMUM DETECTION LIMITS IN ng/L (ppt)**

## APPENDIX VIII

| CONSTITUENT | MDL* |
|---|---|
| CARBOFURAN | 2000 |
| CIPC | 2000 |
| DIALLATE | 2000 |
| EPTAM | 2000 |
| IPC | 2000 |
| PROPOXUR | 2000 |
| SEVIN | 200 |
| SUTAN | 2000 |
| HEXACHLOROCYCLOPENTADIENE | NA |

*** MINIMUM DETECTION LIMITS IN ng/L (ppt)**

# APPENDIX VIII

| CONSTITUENT | MDL* |
|---|---|
| BLANK Di-n-BUTYLPHTHALATE | 0.2 |
| BLANK BIS (2-ETHYLHEXL) PHTHALATE | 1.0 |
| DIBENZO (a,h) ANTHRACENE | 0.5 |
| BENZO (g, h, i) PERYLENE | 0.2 |
| BIS (2-CHLOROISOPROPYL) ETHER | 0.2 |
| BIS (2-CHLOROETHOXY) METHANE | 0.2 |
| NAPHTHALENE | 0.2 |
| ACENAPHTHYLENE | 0.2 |
| 2,6-DINITROTOLUENE | 0.5 |
| ACENAPHTHENE | 0.2 |
| 4-CHLOROPHENYL PHENYL ETHER | 0.2 |
| 2,4-DINITROTOLUENE | 0.5 |
| FLUORENE | 0.2 |
| N-NITROSODIPHENYLAMINE | 2.0 |
| 4-BROMOPHENYL PHENYL ETHER | 0.2 |
| PHENANTHRENE | 0.2 |
| ANTHRACENE | 0.2 |
| Di-n-BUTYLPHTHALATE | 0.2 |
| FLUORANTHENE | 0.2 |
| PYRENE | 0.2 |
| BUTYLBENZYLPHTHALATE | 0.5 |

*** MINIMUM DETECTION LIMITS IN ng/L (ppt)**

# APPENDIX VIII

| CONSTITUENT | MDL* |
|---|---|
| BENZO (a) ANTHRACENE | 0.2 |
| CHRYSENE | 0.2 |
| BIS-(2-ETHYLHEXYL) PHTHALATE | 1.0 |
| Di-n-OCTYLPHTALATE | 0.2 |
| BENZO (k) FLUORANTHENE | 0.3 |
| BENZO (a) PYRENE | 0.2 |
| INDENO (1,2,3-cd) PYRENE | 0.5 |
| DIPHENYLAMINE | 2.0 |
| 3,3-DICHLOROBENZIDINE | 1.0 |
| BIS (2-CHLOROETHYL) ETHER | 0.5 |
| CAMPHENE | 0.5 |
| DIPHENYL ETHER | 0.2 |
| N-NITROSODI-N-PROPYLAMINE | 0.5 |
| 1-CHLORONAPHTHALENE | 0.2 |
| 1-METHYLNAPHTHALENE | 0.5 |
| 2-CHLORONAPHTHALENE | 0.2 |
| 2-METHYLNAPHTHALENE | 0.2 |
| 5-NITROACENAPHTHENE | 1.0 |
| BENZO (B) FLUORANTHENE | 0.2 |
| BIPHENYL | 0.2 |
| INDOLE | 0.2 |
| PERYLENE | 0.5 |

*** MINIMUM DETECTION LIMITS IN ng/L (ppt)**

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMTERS COMPARED TO ONTARIO DRINKING WATER OBJECTIVES (ODWO).
ALL VALUES IN ng/L (ppt).

| CONSTITUENT | ODWO GUIDELINES | SAMPLE 1-117A | 1-117B | 1-193A | 1-193B | 1-303A | 1-303B | 1-350A | 1-350B | 1-88A | 1-88B | 1-158A | 1-158B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4,6-TRICHLOROPHENOL | 5000 | <20 | <20 | <40 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| 2,4,5-TRICHLOROPHENOL | | <100 | <100 | <200 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,3,4-TRICHLOROPHENOL | | <100 | <100 | <200 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,3,5,6-TETRACHLOROPHENOL | | <10 | <10 | <20 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 2,3,4,5-TETRACHLOROPHENOL | | <20 | <20 | <40 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PENTACHLOROPHENOL | 60000 | <10 | <10 | <20 | <10 | 20 | 20 | <10 | 20 | <10 | <10 | <10 | <10 |
| DICAMBA | 120000 | <50 | <50 | <100 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| 2,4,D-PROPIONIC ACID | | <100 | <100 | <200 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,4-DICHLOROPHENOXYACETIC | | <100 | <100 | <200 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| SILVEX | | <20 | <20 | <40 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| 2,4,5-TRICHLOROPHENOXYACETIC | | <50 | <50 | <100 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| 2,4-DICHLOROPHENOXYBUTYRC | | <200 | <200 | <400 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| PICLORAM | 190000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| AMETRYNE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| PROMETONE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| PROPAZINE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| ATRAZINE | | 110 | 120 | 100 | 90 | 100 | <50 | 130 | 80 | 110 | 80 | 120 | 60 |
| PROMETRYNE | 10000 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| SIMAZINE | 100000 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| SENCOR | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| BLADEX | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| ATRATONE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| DETHYLATED ATRAZINE | | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| METOLACHLOR | 50000 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 |
| LASSO | | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 |
| DIETHYL SIMAZINE | | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| HEXACHLOROETHANE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,3,5-TRICHLOROBENZENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,4-TRICHLOROBENZENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| HEXACHLOROBUTADIENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,2,3-TRICHLOROBENZENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2,4,5-TRICHLOROTOLUENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2,3,6-TRICHLOROTOLUENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,3,5-TETRACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,2,4,5-TETRACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 2,6,a-TRICHLOROTOLUENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,3,4-TETRACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| PENTACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| PCB (total) | | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN ng/L (ppt).

| CONSTITUENT | SAMPLE 1-117A | 1-117B | 1-193A | 1-193B | 1-303A | 1-303B | 1-350A | 1-350B | 1-88A | 1-88B | 1-158A | 1-158B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HEXACHLOROBENZENE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| HEPTACHLOR | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| ALDRIN | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| PP-DDE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| MIREX | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| A-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| B-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| G-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| A-CHLORDANE | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| G-CHLORDANE | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| OXYCHLORDANE | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| OP-DDT | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| PP-DDD | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| PP-DDT | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| DMDT METHOXYCHLOR | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| HEPTACHLOREPOXIDE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| ENDOSULFAN I | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| DIELDRIN | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| ENDRIN | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| ENDOSULFAN II | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| ENDOSULFAN SULPHATE | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| OCTOCHLOROSTYRENE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| TOXAPHENE | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 |
| DIAZINON | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| DICHLOROVOS | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| DURSBAN | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| ETHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| GUTHION | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| MALATHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| MEVINPHOS | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| METHYLPARATHION | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| METHYLTRITHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PARATHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PHORATE (THIMET) | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| RELDAN | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| RONNEL | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| AMINOCARB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| BENOMYL | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| BUX | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN ng/L (ppt).

| CONSTITUENT | SAMPLE<br>1-117A | 1-117B | 1-193A | 1-193B | 1-303A | 1-303B | 1-350A | 1-350B | 1-88A | 1-88B | 1-158A | 1-158B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CARBOFURAN | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| CIPC | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| DIALLATE | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| EPTAM | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| IPC | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| PROPOXUR | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| SEVIN | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| SUTAN | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| HEXACHLOROCYCLOPENTADIENE | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS IN WATER. ALL VALUES IN µg/L (ppb).

| CONSTITUENT | SAMPLE 1-117A | 1-117B | 1-193A | 1-193B | 1-303A | 1-303B | 1-303A (DUP) | 1-303B (DUP) | 1-88A | 1-88B | 1-158A | 1-158B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BLANK Di-N-BUTYLPHTHALATE | 18.1 | 18.1 | 18.1 | 18.1 | 18.1 | 18.1 | 18.1 | - | 18.6 | 18.6 | 18.3 | 18.3 |
| BLANK BIS (2-ETHYLHEXL) PHTHALATE | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | - | 4.0 | 4.0 | 4.0 | 4.0 |
| DIBENZO (a,h) ANTHRACENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| BENZO (g, h, i) PERYLENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| BIS (2-CHLOROISOPROPYL) ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| BIS (2-CHLOROETHOXY) METHANE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| NAPHTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| ACENAPHTHYLENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| 2,6-DINITROTOLUENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| ACENAPHTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| 4-CHLOROPHENYL PHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| 2,4-DINITROTOLUENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| FLUORENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| N-NITROSODIPHENYLAMINE | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | - | <2.0 | <2.0 | <2.0 | <2.0 |
| 4-BROMOPHENYL PHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| PHENANTHRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| ANTHRACENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| Di-n-BUTYLPHTHALATE | 21.1 | 24.4 | 21.0 | 24.1 | 21.4 | 22.8 | 20.0 | - | 21.7 | 40.0 | 17.0 | 23.3 |
| FLUORANTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| PYRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| BUTYLBENZYLPHTHALATE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS IN WATER. ALL VALUES IN µg/L (ppb).

| CONSTITUENT | SAMPLE<br>1-31A | 1-31B | 1-37A | 1-37B | 1-136A | 1-136B | 1-181A | 1-181B | 1-204A | 1-204B | 2-9A | 2-9B | 2-10A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BLANK Di-N-BUTYLPHTHALATE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | 24.4 | 24.4 | 24.4 |
| BLANK BIS (2-ETHYLHEXL) PHTHALATE | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | NA | <1.0 | <1.0 | <1.0 | <1.0 | 4.0 | 4.0 | 4.0 |
| DIBENZO (a,h) ANTHRACENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| BENZO (g, h, i) PERYLENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BIS (2-CHLOROISOPROPYL) ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BIS (2-CHLOROETHOXY) METHANE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| NAPHTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ACENAPHTHYLENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 2,6-DINITROTOLUENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ACENAPHTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 4-CHLOROPHENYL PHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 2,4-DINITROTOLUENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| FLUORENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| N-NITROSODIPHENYLAMINE | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | NA | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 4-BROMOPHENYL PHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| PHENANTHRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ANTHRACENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Di-n-BUTYLPHTHALATE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | 12.0 | 15.9 | 17.6 | <0.2 | <0.2 | <0.2 |
| FLUORANTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| PYRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BUTYLBENZYLPHTHALATE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |

APPENDIX VIII (Cont'd)   CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS.  ALL VALUES IN ng/L (ppt).

| CONSTITUENT | ODWO GUIDELINES | SAMPLE 1-126A | 1-126B | 1-126A (DUP) | 1-126B (DUP) | TRIP BLANK | 1-151A | 1-151B | 1-52A | 1-52B |
|---|---|---|---|---|---|---|---|---|---|---|
| 2,4,6-TRICHLOROPHENOL | 5000 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| 2,4,5-TRICHLOROPHENOL | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,3,4-TRICHLOROPHENOL | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,3,5,6-TETRACHLOROPHENOL | | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 2,3,4,5-TETRACHLOROPHENOL | | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PENTACHLOROPHENOL | 60000 | <10 | <10 | <10 | <10 | <10 | <10 | 10 | <10 | 10 |
| DICAMBA | 120000 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| 2,4,D-PROPIONIC ACID | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,4-DICHLOROPHENOXYACETIC | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| SILVEX | | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| 2,4,5-TRICHLOROPHENOXYACETIC | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| 2,4-DICHLOROPHENOXYBUTYRC | | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| PICLORAM | 190000 | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| AMETRYNE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| PROMETONE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| PROPAZINE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| ATRAZINE | 60000 | 110 | 100 | 90 | 110 | <50 | 100 | 50 | 60 | 90 |
| PROMETRYNE | 10000 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| SIMAZINE | 100000 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| SENCOR | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| BLADEX | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| ATRATONE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| DETHYLATED ATRAZINE | | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| METOLACHLOR | 50000 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 |
| LASSO | | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 |
| DIETHYL SIMAZINE | | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| HEXACHLOROETHANE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,3,5-TRICHLOROBENZENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,4-TRICHLOROBENZENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | 12 |
| HEXACHLOROBUTADIENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,2,3-TRICHLOROBENZENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2,4,5-TRICHLOROTOLUENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2,3,6-TRICHLOROTOLUENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,3,5-TETRACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 3 |
| 1,2,4,5-TETRACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 4 |
| 2,6,a-TRICHLOROTOLUENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,3,4-TETRACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 3 |
| PENTACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 4 |
| PCB (total) | | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN ng/L (ppt).

| CONSTITUENT | SAMPLE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1-126A | 1-126B | 1-126A (DUP) | 1-126B (DUP) | TRIP BLANK | 1-151A | 1-151B | 1-52A | 1-52B |
| HEXACHLOROBENZENE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 3 |
| HEPTACHLOR | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| ALDRIN | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| PP-DDE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| MIREX | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| A-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 1 | <1 |
| B-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| G-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | 3 |
| A-CHLORDANE | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| G-CHLORDANE | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| OXYCHLORDANE | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| OP-DDT | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| PP-DDD | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| PP-DDT | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| DMDT METHOXYCHLOR | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| HEPTACHLOREPOXIDE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| ENDOSULFAN I | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| DIELDRIN | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| ENDRIN | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| ENDOSULFAN II | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| ENDOSULFAN SULPHATE | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| OCTOCHLOROSTYRENE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| TOXAPHENE | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 |
| DIAZINON | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| DICHLOROVOS | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| DURSBAN | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| ETHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| GUTHION | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| MALATHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| MEVINPHOS | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| METHYLPARATHION | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| METHYLTRITHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PARATHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PHORATE (THIMET) | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| RELDAN | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| RONNEL | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| AMINOCARB | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| BENOMYL | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| BUX | NA | NA | NA | NA | NA | NA | NA | NA | NA |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN ng/L (ppt).

| CONSTITUENT | SAMPLE | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1-126A | 1-126B | 1-126A (DUP) | 1-126B (DUP) | TRIP BLANK | 1-151A | 1-151B | 1-52A | 1-52B |
| CARBOFURAN | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| CIPC | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| DIALLATE | NA | NA | NA | NA | NA | <2000 | <2000 | <2000 | <2000 |
| EPTAM | NA | NA | NA | NA | NA | <2000 | <2000 | <2000 | <2000 |
| IPC | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| PROPOXUR | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| SEVIN | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| SUTAN | NA | NA | NA | NA | NA | <2000 | <2000 | <2000 | <2000 |
| HEXACHLOROCYCLOPENTADIENE | NA | NA | NA | NA | NA | NA | NA | NA | NA |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN µg/L (ppb).

| CONSTITUENT | SAMPLE 1-126A | 1-126B | 1-126A (DUP) | 1-126B (DUP) | TRIP BLANK | 1-151A | 1-151B | 1-52A | 1-52B |
|---|---|---|---|---|---|---|---|---|---|
| BLANK Di-N-BUTYLPHTHALATE | 18.1 | 18.1 | 18.1 | 18.1 | 18.1 | 18.1 | - | 24.4 | 24.4 |
| BLANK BIS (2-ETHYLHEXL) PHTHALATE | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | 4.0 | - | 4.0 | 4.0 |
| DIBENZO (a,h) ANTHRACENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 |
| BENZO (g, h, i) PERYLENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| BIS (2-CHLOROISOPROPYL) ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| BIS (2-CHLOROETHOXY) METHANE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| NAPHTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| ACENAPHTHYLENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| 2,6-DINITROTOLUENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 |
| ACENAPHTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| 4-CHLOROPHENYL PHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| 2,4-DINITROTOLUENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 |
| FLUORENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| N-NITROSODIPHENYLAMINE | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | - | <2.0 | <2.0 |
| 4-BROMOPHENYL PHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| PHENANTHRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| ANTHRACENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| Di-n-BUTYLPHTHALATE | 21.1 | 24.4 | 21.0 | 24.1 | 22.8 | 20.0 | - | <0.2 | <0.2 |
| FLUORANTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| PYRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 |
| BUTYLBENZYLPHTHALATE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN µg/L (ppb).

| CONSTITUENT | SAMPLE 1-126A | 1-126B | 1-126A (DUP) | 1-126B (DUP) | TRIP BLANK | 1-151A | 1-151B | 1-52A | 1-52B |
|---|---|---|---|---|---|---|---|---|---|
| BENZO (a) ANTHRACENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| CHRYSENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BIS-(2-ETHYLHEXYL) PHTHALATE | 3.0 | 3.0 | 3.0 | 5.0 | 7.0 | 5.0 | 3.0 | 5.0 | 4.0 |
| DI-n-OCTYLPHTHALATE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BENZO (k) FLUORANTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BENZO (a) PYRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| INDENO (1,2,3-cd) PYRENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| DIPHENYLAMINE | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 3,3-DICHLOROBENZIDINE | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| BIS (2-CHLOROETHYL) ETHER | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| CAMPHENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| DIPHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| N-NITROSODI-N-PROPYLAMINE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 1-CHLORONAPHTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1-METHYLNAPHTHALENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 2-CHLORONAPTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 2-METHYLNAPHTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 5-NITROACENAPHTHENE | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| BENZO (B) FLUORANTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BIPHENYL | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| INDOLE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| PERYLENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 | <0.5 |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETER. ALL VALUES IN ng/L (ppt).

| CONSTITUENT | ODWO GUIDELINES | SAMPLE 1-31A | 1-31B | 1-37A | 1-37B | 1-136A | 1-136B | 1-181A | 1-181B | 1-204A | 1-204B | 2-9A | 2-9B | 2-10A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4,6-TRICHLOROPHENOL | 5000 | <20 | <20 | <20 | <20 | NA | <20 | NA | <20 | <20 | <20 | <20 | <20 | <20 |
| 2,4,5-TRICHLOROPHENOL |  | <100 | <100 | <110 | <100 | NA | <100 | NA | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,3,4-TRICHLOROPHENOL |  | <100 | <100 | <110 | <100 | NA | <100 | NA | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,3,5,6-TETRACHLOROPHENOL |  | <10 | <10 | <10 | <10 | NA | <10 | NA | <10 | <10 | <10 | <10 | <10 | <10 |
| 2,3,4,5-TETRACHLOROPHENOL |  | <20 | <20 | <20 | <20 | NA | <20 | NA | <20 | <20 | <20 | <20 | <20 | <20 |
| PENTACHLOROPHENOL | 60000 | <10 | <10 | <10 | <10 | NA | <10 | NA | 10 | <10 | <10 | 20 | <10 | <10 |
| DICAMBA | 120000 | <50 | <50 | <60 | <50 | NA | <50 | NA | <50 | <50 | <50 | <50 | <50 | <50 |
| 2,4,D-PROPIONIC ACID |  | <100 | <100 | <110 | <100 | NA | <100 | NA | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,4-DICHLOROPHENOXYACETIC |  | <100 | <100 | <110 | <100 | NA | <100 | NA | <100 | <100 | <100 | <100 | <100 | <100 |
| SILVEX |  | <20 | <20 | <20 | <20 | NA | <20 | NA | <20 | <20 | <20 | <20 | <20 | <20 |
| 2,4,5-TRICHLOROPHENOXYACETIC |  | <50 | <50 | <60 | <50 | NA | <50 | NA | <50 | <50 | <50 | <50 | <50 | <50 |
| 2,4-DICHLOROPHENOXYBUTYRC |  | <200 | <200 | <230 | <200 | NA | <200 | NA | <200 | <200 | <200 | <200 | <200 | <200 |
| PICLORAM | 190000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| AMETRYNE |  | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| PROMETONE |  | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| PROPAZINE |  | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| ATRAZINE |  | 140 | 100 | 60 | 100 | 80 | <50 | 90 | <50 | <50 | <50 | 110 | 120 | 120 |
| PROMETRYNE | 10000 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| SIMAZINE | 100000 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| SENCOR |  | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| BLADEX |  | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| ATRATONE |  | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| DETHYLATED ATRAZINE |  | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| METOLACHLOR | 50000 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <200 |
| LASSO |  | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <200 |
| DIETHYL SIMAZINE |  | <200 | <200 | <200 | <200 | <500 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| HEXACHLOROETHANE |  | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,3,5-TRICHLOROBENZENE |  | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,4-TRICHLOROBENZENE |  | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| HEXACHLOROBUTADIENE |  | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,2,3-TRICHLOROBENZENE |  | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2,4,5-TRICHLOROTOLUENE |  | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2,3,6-TRICHLOROTOLUENE |  | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,3,5-TETRACHLOROBENZENE |  | <1 | <1 | <1 | <1 | <5 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <5 |
| 1,2,4,5-TETRACHLOROBENZENE |  | <1 | <1 | <1 | <1 | <5 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <5 |
| 2,6,a-TRICHLOROTOLUENE |  | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,3,4-TETRACHLOROBENZENE |  | <1 | <1 | <1 | <1 | <5 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| PENTACHLOROBENZENE |  | <1 | <1 | <1 | <1 | <5 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| PCB (total) |  | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANICAND PESTICIDE PARAMETERS. ALL VALUES IN ng/L (ppt).

| CONSTITUENT | SAMPLE 1-31A | 1-31B | 1-37A | 1-37B | 1-136A | 1-136B | 1-181A | 1-181B | 1-204A | 1-204B | 2-9A | 2-9B | 2-10A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| HEXACHLOROBENZENE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| HEPTACHLOR | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| ALDRIN | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| PP-DDE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| MIREX | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| A-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | 1 | 1 | 2 | <1 | <1 | <1 | <1 | <1 | <1 | 1 | 1 |
| B-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| G-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| A-CHLORDANE | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | 2 | <2 |
| G-CHLORDANE | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | 2 | <2 |
| OXYCHLORDANE | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| OP-DDT | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| PP-DDD | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| PP-DDT | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| DMDT METHOXYCHLOR | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| HEPTACHLOREPOXIDE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| ENDOSULFAN I | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| DIELDRIN | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| ENDRIN | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| ENDOSULFAN II | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| ENDOSULFAN SULPHATE | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| OCTOCHLOROSTYRENE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <5 |
| TOXAPHENE | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 |
| DIAZINON | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| DICHLOROVOS | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| DURSBAN | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| ETHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| GUTHION | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| MALATHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| MEVINPHOS | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| METHYLPARATHION | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| METHYLTRITHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PARATHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PHORATE (THIMET) | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| RELDAN | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| RONNEL | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| AMINOCARB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| BENOMYL | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| BUX | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMTERS. ALL VALUES IN ng/L (ppt).

| | SAMPLE | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CONSTITUENT | 1-31A | 1-31B | 1-37A | 1-37B | 1-136A | 1-136B | 1-181A | 1-181B | 1-204A | 1-204B | 2-9A | 2-9B | 2-10A |
| CARBOFURAN | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| CIPC | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| DIALLATE | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| EPTAM | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| IPC | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| PROPOXUR | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| SEVIN | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| SUTAN | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| HEXACHLOROCYCLOPENTADIENE | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN µg/L (ppb).

| CONSTITUENT | SAMPLE 1-117A | 1-117B | 1-193A | 1-193B | 1-303A | 1-303B | 1-303A (DUP) | 1-303B (DUP) | 1-88A | 1-88B | 1-158A | 1-158B |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BENZO (a) ANTHRACENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| CHRYSENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| BIS-(2-ETHYLHEXYL) PHTHALATE | 3.0 | 3.0 | 3.0 | 5.0 | 7.0 | 5.0 | 3.0 | - | 3.0 | 6.0 | 5.0 | 4.0 |
| DI-n-OCTYLPHTHALATE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| BENZO (k) FLUORANTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| BENZO (a) PYRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| INDENO (1,2,3-cd) PYRENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| DIPHENYLAMINE | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | - | <2.0 | <2.0 | <2.0 | <2.0 |
| 3,3-DICHLOROBENZIDINE | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | - | <1.0 | <1.0 | <1.0 | <1.0 |
| BIS (2-CHLOROETHYL) ETHER | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| CAMPHENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| DIPHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| N-NITROSODI-N-PROPYLAMINE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| 1-CHLORONAPHTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| 1-METHYLNAPHTHALENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |
| 2-CHLORONAPTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| 2-METHYLNAPHTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| 5-NITROACENAPHTHENE | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | - | <1.0 | <1.0 | <1.0 | <1.0 |
| BENZO (B) FLUORANTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| BIPHENYL | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| INDOLE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | - | <0.2 | <0.2 | <0.2 | <0.2 |
| PERYLENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | - | <0.5 | <0.5 | <0.5 | <0.5 |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN µg/L (ppb).

| CONSTITUENT | SAMPLE<br>1-31A | 1-31B | 1-37A | 1-37B | 1-136A | 1-136B | 1-181A | 1-181B | 1-204A | 1-204B | 2-9A | 2-9B | 2-10A |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| BENZO (a) ANTHRACENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| CHRYSENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BIS-(2-ETHYLHEXYL) PHTHALATE | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | NA | <1.0 | 7.0 | 11.0 | 7.0 | 5.0 | 7.0 | 4.0 |
| DI-n-OCTYLPHTHALATE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BENZO (k) FLUORANTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BENZO (a) PYRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| INDENO (1,2,3-cd) PYRENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | <0.5 | <0.2 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| DIPHENYLAMINE | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | NA | <2.0 | <0.2 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 3,3-DICHLOROBENZIDINE | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | NA | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| BIS (2-CHLOROETHYL) ETHER | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | <0.5 | <1.0 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| CAMPHENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| DIPHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| N-NITROSODI-N-PROPYLAMINE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 1-CHLORONAPHTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1-METHYLNAPHTHALENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| 2-CHLORONAPTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 2-METHYLNAPHTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 5-NITROACENAPHTHENE | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | NA | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| BENZO (B) FLUORANTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BIPHENYL | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| INDOLE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | NA | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| PERYLENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | NA | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.2 |

# APPENDIX VIII

| CONSTITUENT | MDL* |
|---|---|
| 2,4,6-TRICHLOROPHENOL | 20 |
| 2,4,5-TRICHLOROPHENOL | 100 |
| 2,3,4-TRICHLOROPHENOL | 100 |
| 2,3,5,6-TETRACHLOROPHENOL | 10 |
| 2,3,4,5-TETRACHLOROPHENOL | 20 |
| PENTACHLOROPHENOL | 10 |
| DICAMBA | 50 |
| 2,4,D-PROPIONIC ACID | 100 |
| 2,4-DICHLOROPHENOXYACETIC | 100 |
| SILVEX | 20 |
| 2,4,5-TRICHLOROPHENOXYACETIC | 50 |
| 2,4-DICHLOROPHENOXYBUTYRC | 200 |
| PICLORAM | NA |
| AMETRYNE | 50 |
| PROMETONE | 50 |
| PROPAZINE | 50 |
| ATRAZINE | 50 |
| PROMETRYNE | 50 |
| SIMAZINE | 50 |
| SENCOR | 100 |
| BLADEX | 100 |
| ATRATONE | 50 |
| DETHYLATED ATRAZINE | 200 |
| METOLACHLOR | 500 |
| LASSO | 500 |
| DIETHYL SIMAZINE | 200 |
| HEXACHLOROETHANE | 1 |
| 1,3,5-TRICHLOROBENZENE | 5 |
| 1,2,4-TRICHLOROBENZENE | 5 |
| HEXACHLOROBUTADIENE | 1 |
| 1,2,3-TRICHLOROBENZENE | 5 |
| 2,4,5-TRICHLOROTOLUENE | 5 |
| 2,3,6-TRICHLOROTOLUENE | 5 |
| 1,2,3,5-TETRACHLOROBENZENE | 1 |
| 1,2,4,5-TETRACHLOROBENZENE | 1 |
| 2,6,a-TRICHLOROTOLUENE | 5 |
| 1,2,3,4-TETRACHLOROBENZENE | 1 |
| PENTACHLOROBENZENE | 1 |
| PCB (total) | 20 |

*** MINIMUM DETECTION LIMITS IN ng/L (ppt)**

# APPENDIX VIII

| CONSTITUENT | MDL* |
|---|---|
| HEXACHLOROBENZENE | 1 |
| HEPTACHLOR | 1 |
| ALDRIN | 1 |
| PP-DDE | 1 |
| MIREX | 5 |
| A-BHC HEXACHLOROCYCLOHEXANE | 1 |
| B-BHC HEXACHLOROCYCLOHEXANE | 1 |
| G-BHC HEXACHLOROCYCLOHEXANE | 1 |
| A-CHLORDANE | 2 |
| G-CHLORDANE | 2 |
| OXYCHLORDANE | 2 |
| OP-DDT | 5 |
| PP-DDD | 5 |
| PP-DDT | 5 |
| DMDT METHOXYCHLOR | 5 |
| HEPTACHLOREPOXIDE | 1 |
| ENDOSULFAN I | 2 |
| DIELDRIN | 2 |
| ENDRIN | 5 |
| ENDOSULFAN II | 5 |
| ENDOSULFAN SULPHATE | 5 |
| OCTOCHLOROSTYRENE | 1 |
| TOXAPHENE | 500 |
| DIAZINON | 20 |
| DICHLOROVOS | 20 |
| DURSBAN | 20 |
| ETHION | 20 |
| GUTHION | NA |
| MALATHION | 20 |
| MEVINPHOS | 20 |
| METHYPARATHION | 50 |
| METHYLTRITHION | 20 |
| PARATHION | 20 |
| PHORATE (THIMET) | 20 |
| RELDAN | 20 |
| RONNEL | 20 |
| AMINOCARB | NA |
| BENOMYL | NA |
| BUX | NA |

* MINIMUM DETECTION LIMITS IN ng/L (ppt)

# APPENDIX VIII

| CONSTITUENT | MDL* |
|---|---|
| CARBOFURAN | 2000 |
| CIPC | 2000 |
| DIALLATE | 2000 |
| EPTAM | 2000 |
| IPC | 2000 |
| PROPOXUR | 2000 |
| SEVIN | 200 |
| SUTAN | 2000 |
| HEXACHLOROCYCLOPENTADIENE | NA |

*** MINIMUM DETECTION LIMITS IN ng/L (ppt)**

## APPENDIX VIII

| CONSTITUENT | MDL* |
|---|---|
| BLANK Di-n-BUTYLPHTHALATE | 0.2 |
| BLANK BIS (2-ETHYLHEXL) PHTHALATE | 1.0 |
| DIBENZO (a,h) ANTHRACENE | 0.5 |
| BENZO (g, h, i) PERYLENE | 0.2 |
| BIS (2-CHLOROISOPROPYL) ETHER | 0.2 |
| BIS (2-CHLOROETHOXY) METHANE | 0.2 |
| NAPHTHALENE | 0.2 |
| ACENAPHTHYLENE | 0.2 |
| 2,6-DINITROTOLUENE | 0.5 |
| ACENAPHTHENE | 0.2 |
| 4-CHLOROPHENYL PHENYL ETHER | 0.2 |
| 2,4-DINITROTOLUENE | 0.5 |
| FLUORENE | 0.2 |
| N-NITROSODIPHENYLAMINE | 2.0 |
| 4-BROMOPHENYL PHENYL ETHER | 0.2 |
| PHENANTHRENE | 0.2 |
| ANTHRACENE | 0.2 |
| Di-n-BUTYLPHTHALATE | 0.2 |
| FLUORANTHENE | 0.2 |
| PYRENE | 0.2 |
| BUTYLBENZYLPHTHALATE | 0.5 |

*** MINIMUM DETECTION LIMITS IN ng/L (ppt)**

## APPENDIX VIII

| CONSTITUENT | MDL* |
|---|---|
| BENZO (a) ANTHRACENE | 0.2 |
| CHRYSENE | 0.2 |
| BIS-(2-ETHYLHEXYL) PHTHALATE | 1.0 |
| Di-n-OCTYLPHTALATE | 0.2 |
| BENZO (k) FLUORANTHENE | 0.3 |
| BENZO (a) PYRENE | 0.2 |
| INDENO (1,2,3-cd) PYRENE | 0.5 |
| DIPHENYLAMINE | 2.0 |
| 3,3-DICHLOROBENZIDINE | 1.0 |
| BIS (2-CHLOROETHYL) ETHER | 0.5 |
| CAMPHENE | 0.5 |
| DIPHENYL ETHER | 0.2 |
| N-NITROSODI-N-PROPYLAMINE | 0.5 |
| 1-CHLORONAPHTHALENE | 0.2 |
| 1-METHYLNAPHTHALENE | 0.5 |
| 2-CHLORONAPHTHALENE | 0.2 |
| 2-METHYLNAPHTHALENE | 0.2 |
| 5-NITROACENAPHTHENE | 1.0 |
| BENZO (B) FLUORANTHENE | 0.2 |
| BIPHENYL | 0.2 |
| INDOLE | 0.2 |
| PERYLENE | 0.5 |

*** MINIMUM DETECTION LIMITS IN ng/L (ppt)**

APPENDIX VIII CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN ng/L (ppt).

| CONSTITUENT | ODWO GUIDELINES | SAMPLE 1-100A | 1-100B | 1-202A | 1-202B | 1-133A | 1-133B | 1-138A | 1-138B | 1-67A | 1-67B |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2,4,6-TRICHLOROPHENOL | 5000 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| 2,4,5-TRICHLOROPHENOL | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,3,4-TRICHLOROPHENOL | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,3,5,6-TETRACHLOROPHENOL | | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 |
| 2,3,4,5-TETRACHLOROPHENOL | | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PENTACHLOROPHENOL | 60000 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | <10 | 10 | <10 |
| DICAMBA | 120000 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| 2,4,D-PROPIONIC ACID | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| 2,4-DICHLOROPHENOXYACETIC | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| SILVEX | | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| 2,4,5-TRICHLOROPHENOXYACETIC | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| 2,4-DICHLOROPHENOXYBUTYRC | | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| PICLORAM | 190000 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| AMETRYNE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| PROMETONE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| PROPAZINE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| ATRAZINE | 60000 | 70 | <50 | 80 | <50 | 100 | 60 | 100 | 80 | <50 | <50 |
| PROMETRYNE | 10000 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| SIMAZINE | 100000 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| SENCOR | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| BLADEX | | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 | <100 |
| ATRATONE | | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| DETHYLATED ATRAZINE | | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| METOLACHLOR | 50000 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 |
| LASSO | | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 |
| DIETHYL SIMAZINE | | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| HEXACHLOROETHANE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,3,5-TRICHLOROBENZENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,4-TRICHLOROBENZENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| HEXACHLOROBUTADIENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,2,3-TRICHLOROBENZENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2,4,5-TRICHLOROTOLUENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 2,3,6-TRICHLOROTOLUENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,3,5-TETRACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,2,4,5-TETRACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| 2,6,a-TRICHLOROTOLUENE | | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| 1,2,3,4-TETRACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| PENTACHLOROBENZENE | | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| PCB (total) | | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN ng/L (ppt).

| CONSTITUENT | SAMPLE 1-100A | 1-100B | 1-202A | 1-202B | 1-133A | 1-133B | 1-138A | 1-138B | 1-67A | 1-67B |
|---|---|---|---|---|---|---|---|---|---|---|
| HEXACHLOROBENZENE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| HEPTACHLOR | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| ALDRIN | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| PP-DDE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| MIREX | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| A-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| B-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| G-BHC HEXACHLOROCYCLOHEXANE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| A-CHLORDANE | <2 | 5 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| G-CHLORDANE | <2 | 4 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| OXYCHLORDANE | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| OP-DDT | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| PP-DDD | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| PP-DDT | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| DMDT METHOXYCHLOR | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| HEPTACHLOREPOXIDE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| ENDOSULFAN I | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| DIELDRIN | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 | <2 |
| ENDRIN | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| ENDOSULFAN II | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| ENDOSULFAN SULPHATE | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 | <5 |
| OCTOCHLOROSTYRENE | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 | <1 |
| TOXAPHENE | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 | <500 |
| DIAZINON | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| DICHLOROVOS | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| DURSBAN | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| ETHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| GUTHION | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| MALATHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| MEVINPHOS | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| METHYLPARATHION | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 | <50 |
| METHYLTRITHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PARATHION | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| PHORATE (THIMET) | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| RELDAN | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| RONNEL | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 | <20 |
| AMINOCARB | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| BENOMYL | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| BUX | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS. ALL VALUES IN ng/L (ppt).

| CONSTITUENT | SAMPLE<br>1-100A | 1-100B | 1-202A | 1-202B | 1-133A | 1-133B | 1-138A | 1-138B | 1-67A | 1-67B |
|---|---|---|---|---|---|---|---|---|---|---|
| CARBOFURAN | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| CIPC | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| DIALLATE | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| EPTAM | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| IPC | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| PROPOXUR | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| SEVIN | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 | <200 |
| SUTAN | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 | <2000 |
| HEXACHLOROCYCLOPENTADIENE | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

APPENDIX VIII (Cont'd) CHEMICAL ANALYTICAL DATA FOR ORGANIC AND PESTICIDE PARAMETERS IN WATER. ALL VALUES IN µg/L (ppb).

| CONSTITUENT | SAMPLE<br>1-100A | 1-100B | 1-202A | 1-202B | 1-133A | 1-133B | 1-138A | 1-138B | 1-67A | 1-67B |
|---|---|---|---|---|---|---|---|---|---|---|
| BLANK Di-n-BUTYLPHTHALATE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BLANK BIS (2-ETHYLHEXL) PHTHALATE | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 | <1.0 |
| DIBENZO (a,h) ANTHRACENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| BENZO (g, h, i) PERYLENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BIS (2-CHLOROISOPROPYL) ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BIS (2-CHLOROETHOXY) METHANE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| NAPHTHALENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ACENAPHTHYLENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 2,6-DINITROTOLUENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| ACENAPHTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 4-CHLOROPHENYL PHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 2,4-DINITROTOLUENE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| FLUORENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| N-NITROSODIPHENYLAMINE | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 | <2.0 |
| 4-BROMOPHENYL PHENYL ETHER | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| PHENANTHRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| ANTHRACENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Di-n-BUTYLPHTHALATE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| FLUORANTHENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| PYRENE | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| BUTYLBENZYLPHTHALATE | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |